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MANIPULATIVE SURGERY.[1]

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MANIPULATION may be regarded as one of our ordinary surgical weapons which should be used more generally than it is. It is not a highly specialized branch of surgery, but is a simple matter which, provided certain details are borne in mind, belongs to the everyday round of practice.

From time immemorial a practice known as "bone-setting" has been practised by the unqualified. Bone-setters sometimes obtained good results in cases which had been treated unsuccessfully even by the best surgeons. During the last century, largely as a result of the teachings of Hilton and of Hugh Owen Thomas, the profession came to regard pain as "Nature's signal which always demanded rest, complete, prolonged and uninterrupted". The application of this dictum to joint injuries and disease was responsible for the production of a large number of stiff and painful joints. Rest cannot increase the mobility of tissues or lead to the development of muscles. Following the publication in 1867 of Sir James Paget's paper, "Cases that Bone Setters Cure", there commenced a gradual, though slow, change in the attitude of our profession to manipulation. Paget advised us "to learn to imitate what is good and to avoid what is harmful in the practice of the bone setters". Since then, largely owing to the writings of Wharton Hood, Sir Robert Jones and others, the indications for rest and those for movement in joint injury and disease have been more clearly defined. Although at the present time the value of manipulation in the treatment of adhesions is widely

[1] Read at a meeting of the Victorian Branch of the British Medical Association on August 5, 1936.

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appreciated, we are still apt to neglect the more trivial sprains and pains, and many patients are allowed to suffer from partial or permanent loss of function which could be avoided by manipulation.

Manipulation may be defined as the use of movements, forced or gentle, in order to relieve pain and to restore movement in all directions in joints or in muscles which have been affected by injury, by disease or by disability due to prolonged immobilization. Such a definition covers a wide field of activities, which include: (i) the reduction of dislocations; (ii) the correction of certain congenital and acquired deformities, as congenital dislocation of the hip, or talipes; (iii) the prevention and the treatment of adhesions; (iv) the stretching of contracted tissues, especially muscles.

It is with the two last-mentioned groups that we are most directly concerned in this discussion, and particularly with the treatment of adhesions.

Adhesions.

What are adhesions and how do they arise? Adhesions consist of new fibrous tissue and they may be intraarticular or, much more commonly, extraarticular in situation. Extraarticular adhesions may occur in the capsule of the joint and in the periarticular structures, and in tendon sheaths, bursæ and within or around the muscles.

How are adhesions caused? Although rest does not increase the mobility of tissues, it does not of itself frequently cause adhesions. Immobilization of a healthy joint in a normal position will not usually lead to more than the lightest of adhesions; but absolute rest, in the presence of other factors which frequently follow injury or disease, results often in widespread adhesions.

Adhesions Following Injury.

An injury is followed by traumatic inflammation, and a sero-fibrinous effusion appears from: (i) the ruptured vessels, arterial, venous or lymphatic; (ii) from untorn vessels in the vicinity owing to venous stasis; and (iii) if a joint or tendon sheaths are involved, from synovial secretion.

The effusion spreads in all directions in the surrounding tissues, and occurs chiefly in the areolar tissue which fills up the spaces between the various structures and which is especially loosely arranged in the vicinity of joints.

If the injured part is rested too long, some of this fibrinous deposit will become organized and converted to young connective tissue and later to fibrous tissue. Adhesions thus may follow the effusion or hæmorrhage resulting from such injuries as bruising, sprain, fracture or dislocation.

At first, adhesions are soft and yielding, but later they become fibrous and inelastic, and later again they lose their vascularity and form a scar. They may later become associated with adaptive shortening owing to the restriction of the range of movement.

Adaptive Muscle Shortening.—If a muscle is kept for any length of time in such a position that its origin and insertion are approximated, it still keeps its tone by shortening. Even after a few hours such contracted muscles feel stiff and uncomfortable when they are stretched by movement. If such a position is maintained for days or weeks, or even years, a very real shortening occurs, and this adaptive shortening takes place throughout the tissues of the muscle, supporting as well as muscular, and it also appears in the vessels and nerves of the limb. Obviously, adaptive shortening will not respond to manipulation.

The Prevention of Adhesions.—It is very important to prevent the formation of adhesions, for many cases needing manipulation are the result of faulty diagnosis of the nature of the injury and of failure to prevent their appearance; but this subject cannot be dealt with adequately in the present discussion. Watson Jones[1] has recently pointed out that the factors other than immobilization responsible for adhesion formation after injury are those giving rise to continued or repeated sero-fibrinous exudate; and these are: disuse with continued venous stasis, recurrent œdema, the repeated traumata of passive stretching, continued infection, and the irritation of foreign bodies, such as wires, near a joint. Most injured limbs should be moved as soon as possible, provided the injured part is firmly supported, and provided efficient measures are taken to effect the early absorption of the traumatic effusion.

After manipulation we endeavour to prevent by appropriate after-treatment the reformation of the adhesions.

Adhesions Following Disease.

Adhesions may also appear as the result of inflammation of infective or toxic origin, as in arthritis, fibrositis *et cetera*.

An inflamed joint requires rest till all inflammation has subsided. But in certain cases of chronic arthritis, as for example after pyogenic infection or rheumatoid arthritis, we may help to prevent the formation of firm adhesions as soon as the active painful stage is passed by encouraging the patient to move the joint within the painless area, helped, if necessary, by the surgeon.

Symptoms of Adhesions.

Adhesions restrict movement between adjacent tissues, and when stretched they give rise to pain, for fibrous tissue is not intended to withstand strain. The muscles producing the painful movement are functionally inhibited and tend to waste from disuse, while their antagonists may develop a condition of painful spasm. When the muscles relax during sleep a drag on the adhesions may give rise to sudden pain.

Treatment and the Differentiation of Adhesions Following Trauma from Those Following Disease.

The treatment of adhesions following injury is movement, active, passive or forcible; but when

adhesions follow arthritis the treatment is rest until active disease and pain have subsided. When faced with a patient with adhesions, we must therefore differentiate between those conditions which require early movement and those in which some active pathological condition is present, requiring rest.

I have found most helpful Sir Robert Jones's teaching,[2] that with few exceptions a joint, the movement of which is limited in all directions, is, or has been, subject to arthritis; but that when a joint is limited in movement in certain directions only, movement being normal in others, arthritis is not present. This is much more obvious in joints with multiple movements, such as the hip or the shoulder or the spine, than in the knee or the elbow, the movements of which are mainly those of flexion and extension. This statement does not apply to fractures into a joint or to joints stiff after long immobilization. This rule, however, is not absolute. In the presence of adhesions following injury, movements in several directions may be painful at the extremes of the range, but movements within the range allowed by the adhesions are painless and free.

History.—A carefully taken history is usually quite definite. Pain and stiffness coming on rapidly after injury suggest adhesions. The story is often characteristic: there is complete relief in the morning and the pain is induced by activity, becoming steadily worse till rest is taken, when relief is gradually obtained. Certain movements are more painful than others. In severe cases the pain may radiate over a wide area.

The symptoms when inflammatory congestion is present are as follows. There is gradual and progressive stiffness associated with pain. This feeling of stiffness is most pronounced after a period of rest, the first movements in the morning being especially painful. The stiffness wears off during the day, but the pain, which consists of a continuous ache made worse by activity, persists during rest. In these cases the symptoms are the result of the stirring up of areas of inflammation by activity. The phenomena of inflammation do not appear instantaneously, hence the symptom of pain appears gradually; and as an inflammatory process does not disappear instantaneously, the pain persists after rest and in the morning the parts are stiff as a result of the areas of œdema remaining. The œdema is somewhat lessened by activity, and so during the morning the stiffness wears off.

Unfortunately for ease of diagnosis, many cases are mixed in type. In the presence of long-standing adhesions the constant irritation from the frequent stretching of the adherent areas gives rise to a superadded chronic traumatic congestion, and the symptoms of this are indistinguishable from those of the chronic infective inflammatory type.

When adhesions are present it is often possible to demonstrate, on pressure, areas of localized tenderness, for example, at the insertion of the deltoid, when pain is present after injury. With arthritis the joint is often warmer, but when adhesions are present this is not found, except perhaps in local areas. With adhesions any muscular wasting is that due to disuse, but with arthritis the wasting is much more marked.

X Ray Examination.—In no case, however apparently straightforward, should manipulation be undertaken without an X ray examination first being made. A radiogram may demonstrate conditions contraindicating manipulation, which are undiscoverable clinically. Examples of such conditions are blocking of the joint movements by callus after a fracture into the joint, loose bodies, a separated humeral tuberosity after injury to the shoulder, or a chronic abscess or a myeloma in the bone near the joint, or erosion of the articular cartilage. An X ray examination may also indicate that the bones are very fragile. Sir Robert Jones points out that when an X ray examination reveals no abnormality in a long-standing case, this is very valuable evidence, as it certainly excludes arthritis, tuberculous or pyogenic.

Age.—Manipulation is rarely necessary in children. Adhesions are uncommon and tuberculous infection is frequent. Nor is it often advisable in the elderly; their bones are brittle and they are not likely to cooperate in the after-treatment.

Cases Unsuitable for Manipulation.

As a rule, cases unsuitable for manipulation can be differentiated with ease, for example, firm, fibrous ankylosis, fractures into joints, destruction of joint surfaces, stiffness following severe sepsis, tenosynovitis and conditions complicated by nerve injury. There are, however, two conditions in which manipulation is contraindicated; they may give rise to symptoms closely resembling those of conditions in which manipulation is beneficial. They are tuberculous arthritis and *myositis ossificans traumatica*; and these must be carefuly excluded. In early tuberculosis of the hip in children for some weeks there may be no other physical sign than the limitation of one movement, internal rotation. In purely synovial tuberculous infection of the knee the joint may remain freely movable for some time and X ray examination may give no aid.

Cases Suitable for Manipulation.

Cases suitable for manipulation may be grouped as follows:

1. Disability following injury due to: (*a*) Adhesions either intraarticular (the result of hæmorrhage into the joint, synovial damage or traumatic synovitis) or extraarticular or periarticular, following bruising and effusion into the joint capsule (plication adhesions), into ligaments, into origins and insertions of muscles, into the muscle bellies themselves, and into tendon sheaths and bursæ. (*b*) Subluxations.
2. Stiffness following arthritis when all activity has subsided.
3. Certain cases of osteoarthritis.
4. Stiffness following prolonged fixation.

Adhesions after Injury.—Adhesions after injury form the most suitable cases for manipulation and yield the best results. It must be remembered that the disability in this type of adhesion is often out of all proportion to the structural change. A small painful adhesion, for example, in the deltoid insertion may incapacitate the arm. It is in this type of case that the most dramatic cures occur.

Subluxations.—A subluxation is a condition in which the joint surfaces have become displaced so that they are no longer in correct apposition, being held thus by some irregularity or peculiarity in their shape. In dislocation the joint surfaces are no longer in contact. Subluxations are uncommon but there is a certain amount of evidence for their occurrence.

In certain cases symptoms appear with an abrupt origin when apparently there has been no time for adhesions to form. For example, after a sudden movement of the neck there may occur a locking of an intervertebral cervical joint on one side.

Tucker[3] states that after injuries to joints there is sometimes a subluxation of the joint surfaces. Since no provision is made in the joint musculature for correcting such a defect, it remains, and the patient may complain of disability or discomfort. Manipulation in the early stages of injury, he claims, often produces good results, but these may also be explained by the relief of muscular spasm.

Subluxation of the sacro-iliac joint is thought to occur in women when the sacro-iliac ligaments are relaxed following pregnancy or abortion. Since the joint surfaces are not in place in subluxation, certain ligaments of the joint will be under continuous strain and the pain and discomfort will be more or less continuous.

Mobilization of Joints Following Arthritis.—The problem after arthritis is to determine when the joint has recovered from the disease. Sir Robert Jones pointed out that we may assume that a joint has recovered from disease when its range of movement is not diminished by use. If movement in such a joint is increasing, however slowly, we should trust to active movements practised in the absence of weight-bearing, for active movements, being voluntary, are sure to be gentle and are limited by pain. If, however, progress ceases, then we may make a cautious attempt with passive movements, watching carefully the effect. If this has been good, we may attempt a gentle manipulation; but if the range decreases as a result, then rest, not movement, is indicated and the case is unsuitable for manipulation.

The condition in which such a problem frequently presents itself is in non-ankylosing rheumatoid arthritis. For the following reasons I cannot too strongly condemn the "breaking down" so often carried out in this type of joint: (i) Adaptive muscle shortening is present, and this cannot be remedied by sudden manipulation. To do so is to inflict injury. (ii) Moreover, if the joint is "broken down" without injury or reaction, the atrophied and stretched and wasted muscles have no power to move the limb and adequate after-treatment is impossible. To such joints should be applied continuous traction to overcome the adaptive muscle shortening, with frequent gentle stretchings, if indicated, and graduated exercises to develop the disused muscles *pari passu* with the increasing range. Manipulations are then used as indicated above. In this way many joints may be coaxed into activity again, whereas a single "breaking down" would result in such a reaction as to give permanent stiffness.

Osteoarthritis.—Certain selected cases of osteoarthritis are benefited by manipulation. In early cases the pain and stiffness are largely due to adhesions at the periphery following the changes in this part of the joint characteristic of the disease. The relief of pain rather than the restoration of full mobility is our objective. The less the pathological changes shown by X rays, the more successful will be the result, for the changes are then mainly ligamentous; but even in the more marked cases if careful manipulation is carried out improvement may be gained. There may be a reaction for a few days, but ultimately there is great relief of the symptoms. The after-treatment must therefore be adequate, and the patient must endeavour to maintain the increased range. As the condition is a progressive one, manipulation may need repetition at intervals of some months.

Stiffness Following Prolonged Fixation.—When stiffness occurs as a result of prolonged fixation, it is found usually to be due to adaptive muscular shortening, though adhesions may also be present. The patient's own use of the limb will usually overcome both these conditions; but it may be advisable to use continuous traction, and this, rather than forcible manipulation, is indicated.

In fractures it is not always possible to prevent adhesions, especially in the compound variety, when a mild infection is present in the tissues around the joint. If the case is suitable for manipulation, the involved bone should be splinted by a plaster slab, manipulation should be tried in small stages at least two weeks apart and the progress watched.

Pre-Manipulative Treatment.

It is advisable to eliminate any focus of infection, as infection may play a part in the production of adhesions or in their aggravation. Manipulation without this preliminary treatment may be useless.

In the presence of adhesions, sharp pain, occurring only on movement, is complained of, and when to this is added after a time an indefinite aching which persists after exercise, we should be led to suspect the presence of superadded infection, although such a symptom may be due also, as already pointed out, to chronic congestion following repeated stretching of adhesions.

Technique of Manipulation.

Manipulation consists essentially and simply of endeavouring to obtain the full normal range of movement in every direction. The major points of technique are as follow.

Anæsthetic.—In minor cases no anæsthetic may be needed. Relaxation may be obtained by pendulum movements with surprise forcing of the desired movement.

Many manipulations may be performed with gas, which is a more pleasant anæsthetic than ether and which has the advantage that the increased range of movement may be immediately demonstrated to the patient. In some cases it is an advantage to allow the patient to awaken with the limb in the position of full correction; and active and full range exercises may be begun at once.

When the patient is muscular and the adhesions are firm, and when certain joints, such as the shoulder, are affected, ether anæsthesia should be used. When all muscular action is abolished, the resistance of the adhesions to be dealt with and the force needed to overcome them are the better appreciated. Imperfect relaxation may lead to accidents, owing to the sudden giving of the muscular resistance.

Under anæsthesia, however, it becomes easier to damage normal structures and to inflict a severe sprain; and also one may be tempted to perform in one stage what should be divided into successive stages.

Joint Movements.—It is necessary to be acquainted with the normal range of movement of the particular joint, and as this varies in different individuals, comparison must be made with the opposite healthy joint, especially as minor degrees of limitation of movement are of great importance. An apparently complete range of movement does not always exclude adhesions. With pain and muscle spasm eliminated under the anæsthetic, one may detect in these cases slight limitations in the range. Such cases yield the best results, for the reaction following manipulation is negligible.

The normal joint is a complicated mechanism. Even in the hinge joints, such as the metacarpo-phalangeal joints, the movement is not purely that of a hinge. A gliding element is also present, as the centre of rotation is situated in the metacarpal at some distance from the joint surface. This fact must be borne in mind during manipulation when flexion or extension is attempted. Ligamentous strain is easily possible unless the pressure is applied at the correct places.

In the shoulder, a ball and socket joint, Mennell points out that a gliding movement of the head of the humerus as a whole takes place as well as the rotatory movement, the head slipping, for example, downwards during abduction and backwards during flexion. If this cannot occur, the movements of abduction and flexion will be greatly limited in range. Thus a small adhesion in the capsule preventing the associated movement of the head in movements of the arm may lead to a considerable amount of disability.

There are thus two kinds of joint movement to be considered: (i) the movements which are carried out by the patient himself, as flexion, abduction *et cetera*; (ii) the movements possible in the joint, but for which no muscular mechanism is provided. These movements take place across the line of muscle action. Examples are rotation of the proximal phalanx at the metacarpo-phalangeal joints and an antero-posterior movement at this joint, and side-to-side movement of the patella.

Sir Robert Jones and, later, Mennell have pointed out the importance of carrying out the latter movements prior to the voluntary movements. The capsule and the ligaments are freed and the voluntary movements are rendered possible without risk of strain to the ligaments which might otherwise occur.

The importance of these movements across the line of muscle action was pointed out by W. S. Lang, who in 1886 conducted experiments on the cadaver, endeavouring to reproduce the injury of a displaced internal semilunar cartilage. He found that the injury could be easily produced by twisting the joint.

Some years before, the bone-setter Richard Hutton, instructing Wharton Hood in the methods of his practice, had insisted: "pulling is of little avail, it is the twist as does it".

"Hutton had found out by experience that when adhesions in a joint are to be broken down it is useless to pull on the limb, it must be twisted."[4] The muscles around a joint can protect it against pulling, but some joints have no muscular mechanism to save them from being twisted. Hence in twisting there is no muscular resistance to be overcome.

For want of a better name we may speak of these movements as the non-vlountary movements, and I am convinced that in many joints they are of the greatest importance in manipulation.

The first movement to be carried out, then, in manipulation is the non-voluntary one of traction. This separates the joint surfaces, minimizes friction and stretches the capsule and ligaments; and if a subluxation is present, it restores the normal joint surface relationships.

Next, carry out the non-voluntary movements of the joint while traction is applied. This frees the ligaments. When a muscle is being manipulated it should be stretched from side to side along its fibres.

Next, still exerting traction, move the joint steadily and with even pressure and suitable force, and not jerkily, through the full range in every direction once. Since many muscles cross more than one joint, combinations of movement must be considered. For example, in manipulating an elbow, it might not be enough to flex and extend, to supinate and pronate the joint. The elbow must

be extended and flexed both in pronation and in supination.

When the extensor origin of the forearm muscles is affected in a variety of tennis elbow, exemplifying a muscle which crosses several joints, when pain on extension of the wrist and on supination is felt, the wrist must be flexed and pronated while the elbow is extended.

The movements of abduction, adduction, extension and flexion of the shoulder should all be carried out in inward and in outward rotation.

Flexion of the hip should be performed with the knee extended and with the knee flexed.

As accurate a diagnosis as possible of the site of the lesion should be made, and of the movements giving pain, and particular attention should be given to these. For example, a patient may not be able to put his hand in his hip pocket; extension of the shoulder with internal rotation is then needed.

Beware of leverage and hold the limb as close to the joint as convenient, especially when the manipulations are forcible.

One hand is used to stabilize the limb while the other mobilizes it.

Once the resistance encountered is overcome or the full range is reached, the movement must instantly cease. To carry on is to risk a sprain, and it is better to have to repeat the manipulation at a later date than to inflict an injury which may give rise to a reaction and exudate. Localized adhesions yield to manipulation often with a sharp, audible crack, but the more diffuse give a soft crackle like the tearing of calico. Most usually the process is not heard, but rather is felt. These cases give the best results. The less you hear or feel, the less is the reaction.

Adequate, appropriate after-treatment must be instituted. In the majority of manipulations there is little or no reaction; but if this is feared, for example after large adhesions have been ruptured, the joint is bandaged firmly over much wool for twenty-four hours, and the after-treatment as for a sprain is carried out, support, heat, massage and active movements being used, but repeated passive stretchings avoided. Pain persisting after movement or decrease in the range must be regarded as a danger signal calling for rest. If the range is increasing, even if pain or effusion is present, rest is contraindicated. Use of the limb is the best therapy.

An injudicious manipulation may, owing to the severe reaction evoked, result in an increase of adhesions, however thorough the after-care.

Causes of Failure.

We may summarize the common causes of failure as follows: lack of knowledge of the range of movements, ignoring adaptive shortening, doing too much and inflicting injury, and failure thoroughly to stretch the adhesions. This may merely irritate them and the symptoms may be increased. This is likely in cases of backache.

The Reactions of Certain Joints.

Fingers.—Since the fingers are composed mainly of bone, tendon and fascia, there is little margin for the accommodation of swelling. Persistent œdema is likely and adhesions rapidly form, and when they are firm little benefit may be expected from manipulation. The prevention of adhesions or their early treatment is of paramount importance.

Elbow.—This joint reacts badly to forced movements, and usually only in certain minor conditions, such as so-called "tennis elbow", is manipulation advisable. We must carefully exclude the presence of *myositis ossificans* following injuries in this region.

Shoulder.—The shoulder joint is especially prone to adhesions and is a difficult joint to manipulate when adhesions are severe. Forcible abduction may dislocate the head and external rotation may fracture the humeral neck. A general anæsthetic with complete muscular relaxation must be used. If the joint is painful following manipulation, the after-treatment may be ineffectual in keeping the joint moving, for, since the scapula moves so easily, the patient may prefer to use this movement rather than to move the shoulder.

The Hip.—Manipulation in early osteoarthritis of the hip is usually most successful in relieving the symptoms.

Knee.—In the case of early and painful osteoarthritis, manipulation of the knee has in my experience given great improvement, provided the patients subsequently maintain by exercise the range of movement obtained.

In the presence of adhesions around the knee following injury it is most important to obtain the full range of movement in rotation of the tibia and in flexion, for these movements are often neglected.

Special Conditions in which Manipulation is Beneficial.

Chronic Foot Strain.

The most satisfactory results follow the use of manipulation in cases of chronic foot strain. This, the most frequent of all foot complaints in our age of concrete and of standardized footwear, follows excessive use of the foot, especially in those whose occupation demands long standing, and in those over weight. Toxæmia and illness, improper use of the foot in a valgoid position, and unsuitable shoes are other causative factors. These patients complain of painful feet, the pain often radiating up the legs. On examination the movements of the foot are limited by pain at the extremes of motion, and the foot has lost to a greater or less degree its quality of suppleness. As a result of any of the above factors and of minor traumata repeated over years, adhesions develop. When the foot musculature becomes tired and inefficient, the body weight is thrown on the adhesions and pain occurs. The treatment of such cases is not rest. Although this may give relief, the fixity of the feet is increased. Nor is the treatment the provision of

arch supports. The feet should be thoroughly mobilized and the normal movements in every direction restored. This should be followed by appropriate exercises, and suitable footwear should be worn.

In early tarsal osteoarthritis manipulation is often beneficial.

Neuralgia or Neuritis.

Many cases of acute so-called occipital neuritis and brachial neuritis and sciatica yield in a dramatic manner to appropriate manipulation.

At a discussion at the Royal Society of Medicine, London,[5] recently, it was agreed that many cases of neuritis resulted from: (i) the direct spread of local inflammatory conditions involving the finer nerves, as in fibrositis in the shoulder region and neck muscles in brachial neuritis, and involving the sciatic notch in the case of sciatica; or (ii) from involvement of the nerves at the intervertebral foramina from a rheumatic or osteoarthritic process.

In many cases of chronic occipital neuralgia there will be found on examination some painful limitation in a particular direction of the movements of the upper part of the neck. Very often attempts at voluntary or passive movement will accentuate the pain. Similarly, in the case of brachial neuritis painful limitation of neck or shoulder movements may be elicited. If under an anæsthetic the full ranges of movement of the head, neck and, if necessary, those of the shoulder are restored, great and sometimes dramatic benefit will result. Similar results may follow the use of manipulation in cases of sciatica, for the majority of them are secondary to spinal arthritis. When sciatica is associated with a flat lower part of the back, it is necessary to stretch the hamstrings thoroughly to restore the normal lumbar curve.

Backache.

The large and difficult subject of backache can receive only brief mention. Manipulation of the spine yields encouraging results in such conditions as lumbar sprain, lumbo-sacral sprain, and sacro-iliac sprain or subluxation, and spinal osteoarthritis. Difficulties arise in the diagnosis of cases suitable and unsuitable for manipulation, as both types often appear superficially similar.

The premonitory symptoms of ankylosing spondylitis, which may be present for years and which start often in the sacro-iliac joint, or those of early spinal osteoarthritis may give rise to a picture resembling that of chronic sacro-iliac strain.

Sepsis often plays an obscure part, being discovered and treated with difficulty, and any septic focus, such as that giving rise to a chronic gonorrhœal prostatitis, or infected tonsils *et cetera*, must first be eliminated. In any case, manipulation must be regarded as just one incident in our scheme of treatment. Indiscriminate manipulation of patients with backache without selection or adequate after-treatment will result in disappointment. The lumbo-sacral joints are surrounded by many mobile joints and are as a result difficult to fix. Lumbo-sacral sprain, therefore, often does not respond very well to manipulation, the force of the manipulation being spent on the other more movable joints above.

Coccydinia.

Coccydinia of traumatic origin usually responds well to manipulation. The coccyx is grasped between the thumb and the index finger in the rectum, and the movements of flexion, extension and slight rotation are carried out.

Coccydinia of non-traumatic origin must be carefully distinguished from that following injury. This type of case seems to result from postural errors and incorrect pelvic weight-bearing and chronic strain of the ligaments connected with the coccyx. Such cases will not benefit by manipulation, but may be corrected by postural reeducation.[1]

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MANIPULATIVE SURGERY.[2]

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No one will claim that progress in medicine and surgery comes invariably through orthodox procedure and investigation. It may be for the ultimate good that conservatism should be the profession's watchword when faced with a host of vaunted remedies. But this same factor necessarily acts as a severe brake where the proposition may carry some truth. Manipulative surgery had been practised for some generations by the unorthodox before it

[1] At the conclusion of his paper Dr. Hembrow showed a cinematograph film to demonstrate the manipulative movements of the various joints.

[2] Read at a meeting of the Orthopædic Section of the New South Wales Branch of the British Medical Association on December 19, 1935. Received for publication, August 24, 1936.

attracted attention from within, and in the inner circle of the profession is only beginning to emerge from the wilderness and has not yet penetrated to the outpost. It is true that the acid test of scientific investigation strips such crusaders of most of their panoply, but occasionally a germ of truth here and there survives. A similar fate befalls most of our observations. Lack of knowledge of the pathology of the joint lesion with which they dealt led the early generations of bone-setters to tragic consequences, many of which came within the observation of H. O. Thomas. In the Banks Lecture in 1931 Robert Jones[1] gave clearly such indications for manipulation as had stood the test of investigation.

That the principles and practice of manipulative surgery are not widely known among medical men is shown in the large number of irregular practitioners of the method under various guises. These methods were so long opposed by the medical profession that in the eyes of the public manipulative surgery naturally became associated with the bone-setters as much as treatment of the teeth was associated with the dental profession. It is difficult, with the breadth of modern surgery, for practitioners to have a working knowledge of all methods of treatment, so that here, where indications are often only with difficulty elucidated, patients are frequently classed as neurotic and forced into unorthodoxy. And these happenings need have no relation to the intelligence of the patient. With modern spectacular achievements in surgery the less conspicuous and less "interesting" chronic lesions attract less attention. In Sydney the number of irregular practitioners is increasing, and these are chiefly osteopaths and chiropractors.

There are three main schools of osteopathy. By the first and most pretentious of these it is held that the nerves convey vitality to the tissues and that any pressure on a nerve trunk therefore leads to the lowering of the vitality of the tissue in the area of distribution, predisposing to pain and disease (including appendicitis, pneumonia, "colds" *et cetera*). This school claims to cure all diseases by manipulation. The second school of thought holds that nerve pressure, by giving rise to pain, may reflexly cause any lesion apart from the recognized infective processes. The third school maintains that minor displacements of joints exist, affecting the sympathetic system, and so it assumes that headache, neuralgia, and brachial neuritis, for example, are associated with the cervical spine, chronic cough with the dorsal spine, and lumbago and sciatica with the lumbar spine. Even this school still speaks of subluxation.

There are similarly many schools among the chiropractors, but they generally have a common basis in percussion performed along the spine with the patient suspended in the prone position, with support under the chest and upper part of the thigh. There are combinations of this manœuvre with any of the three schools of osteopathy.

The procedure has been known in England chiefly under the term of "bone setting", and bone-setters usually speak of bones "being put back into place".

Superstition runs rife in the human race, fostered from the cradle, and the implication of magic and mystery finds ready acceptance. The traditions of bone-setting are therefore not readily broken down, and so tennis players and other athletes with their injuries, for example to the back and ankle, make their journeys across the world. "Bone-setter" is a magic term, and the name "manipulative surgery" retains some of the glamour. It would be almost a pity to define this branch of manipulative surgery as forcible passive movement. For the purpose of this paper manipulative surgery is taken as synonymous with forcible passive movement of joints, excluding congenital malformations.

There can be no doubt that the unqualified have some real success; and their failures are forgotten by a public which remembers that success was achieved after orthodox treatment had failed. It is to be expected that the patient who has obtained relief in these circumstances will trumpet the fact widely to strangers. But the patient who has obtained no relief or whose situation has become even worse is diffident about informing even his close friends *sotto voce*. Unorthodox practitioners, too, will survive, since human nature is reluctant to accept opinions on the incurability of some diseases. We may not as yet be able to prevent practice by the unqualified, but it is for us to see that they have less material on which to build their success. There is need for education of the profession before we may look for a diminution of the extraordinary degree of public conviction in such matters. Witness the effort required to stem the recent introduction of the "Osteopathic Registration Bill" in the British Parliament. Nor is the victory complete.

General indications for manipulative treatment are the presence of adhesions and adaptive shortening of muscle, limiting movement or causing pain. Trauma or inflammation may cause a hæmorrhage or a serous exudate into the tissues. The organization of this exudate results finally in the formation of the avascular cicatricial band termed an "adhesion", which may therefore be extraarticular or intraarticular. The former may bind together in irregular manner any such structures as capsule, ligaments, tendons, muscles and sheaths. The intra-articular type results from trauma, infection or toxæmia, and any structure within the joint may be involved. Postural shortening of muscle, capsule or ligament generally accompanies adhesions, but may exist separately.

Stiffness is often the inevitable result of gross injury or a necessary measure of treatment, but some of the damage requiring forcible movement is preventible. Methods to diminish or disperse local effusion and to deal with inflammatory symptoms are in common use, but it is rare to find adequate

use of posture in prevention of deformity. Thus in a simple Pott's fracture at the ankle joint it is rare to find the ankle splinted in adequate dorsiflexion when immobilization of the foot is used. The subsequent plantar flexion is usually readily obtained with the help of gravity. It is still rarer to find an injured limb maintained in functional activity while strain on damaged tissue is obviated. An illustration of this principle may be found in the method of allowing ambulatory treatment in a Pott's fracture, with plantar flexion and dorsiflexion, and prevention of strain at the site of fracture or torn ligament. These results may be achieved by the use of a Delbet ambulatory plaster, when such can be used. The possibility of stiffness is not often foreseen at the shoulder joint, where the use of an aeroplane splint will prevent the formation of short adhesions in adduction and internal rotation and will allow gravity to "manipulate" ever so slowly the shortenings in abduction and external rotation on removal of the splint.

The use of radiology needs no stressing here as furnishing additional information in pathological conditions of the joint. Inferences may be drawn from the amount of joint space, decalcification of disuse, osteoporosis, *myositis ossificans* and other proximal bone disease. Movement of the tuberculous joint is to be carefully avoided, and the greatest care must be exercised when commencing gentle movement following suppurative arthritis even after a period of recovery of many months' duration.

Forcible movement of the stiff joint should not be practised until after the failure of more conservative treatment, except when, with specific indications, the saving of time is important.

In an examination of the last twenty cases of manipulation of various joints it was surprising to find how frequently this time factor was the main indication for manipulation. When such a lesion is considered quiescent, a period of tentative limited active use is instituted to determine this point, and when no reaction is caused the range of movement is gradually increased. It is of prime importance that restoration of function should be obtained, if possible, through active movement. In such circumstances reciprocal innervation is our ally. Let us consider a limitation of extension at the knee joint with this method in use. If voluntary effort is made to increase function by action of the quadriceps group, there is relaxation of the flexor group with the advantage of stretching the shortened structures. But with passive correction and fear by the patient of severe pain due to movement not under his own control, the flexor group is in contraction and on guard. Active movement is accompanied by cooperation, passive movement by apprehension.

When active movement is insufficient fully to restore the normal range, assisted active movement is carried out, generally for two or three months, with other appropriate physical therapy. In the difficult cases more drastic measures may be indicated. If the residual limitation is of minor degree, a complete range of movement will probably be readily attainable under anæsthesia at one sitting. With greater limitation there are alternative methods. In some joints, for example the knee and the ankle, the method of wedge plaster may be used. Here we have the principle of repetition of a minimal manipulation in one direction, retention in the new position, and an interval for subsidence of reaction and relaxation of tissue. It is of value when reaction is feared and when the object is not so much increase in range as the regaining of a position of mechanical advantage. A restricted knee in flexion may thus be converted to a restricted knee in extension, with sometimes an increase in range of movement. This procédure is just as much to be classed as manipulative surgery as the methods used in those cases in which a graphic, rapid, phasic movement is performed.

An alternative procedure is repeated manipulation under anæsthesia at intervals, without too much being attempted at any one sitting. An increase in movement may sometimes be retained by suitable splints, when the joint permits, until the patient can use the joint through the increased range. Each type of movement is performed until the first obstacle is overcome, and the procedure is repeated at intervals until the range is complete. This method is of particular service at the shoulder joint.

A method is sometimes used which saves much tedious repetition. The full range is obtained at one sitting and heavy cotton wool is applied with plaster of Paris fixation in the new position, because of the reaction and severe pain produced. This is of value (for example at the ankle joint) to permit of walking when other methods may involve recumbency. Here a condition of severe equinus, with pain on attempted dorsiflexion, may sometimes be pushed at one sitting to a weight-bearing dorsiflexion with fixation, so that the patient may walk.

The necessity is obvious for a meticulous knowledge of the anatomy and range of movement of the individual joint, and the range of movement in the contralateral normal joint should be noted. Certain joint movement is not under voluntary control. At the shoulder, the head of the humerus may be pulled away from the glenoid and also moved up and down, backward and forward. With the knee joint in flexion the tibia may be pulled forward and backward beneath the femur. The radius and ulna have relative longitudinal movement. These factors should be remembered at manipulation.

When trauma is the sole ætiological factor, very definite success will often be achieved, and we may expect the result to be permanent with appropriate after-treatment. In chronic non-tuberculous arthritis the patient may often be kept comparatively free from symptoms for periods of twelve months or longer, when he will often ask for a repetition of the procedure. Since arthritis fre-

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quently follows trauma or exists prior to the injury, this factor complicates many manipulations. I am firmly convinced that the most exhaustive treatment of the arthritis should be undertaken and that no manipulation should be performed until quiescence of the arthritis is well established. Many failures can thus be avoided. In a recent discussion on chronic arthritis in *The Journal of Bone and Joint Surgery*, October, 1935, Pemberton[2] summarizes the histories of a series of 300 patients treated conservatively, and gives 6% as cured, 89% as greatly improved, and 5% as failures. He also states that though most of these patients had been thoroughly overhauled and treated before admission to hospital, 76% still had focal infection which had either been missed or had occurred subsequent to their initial treatment. The procedure of manipulation is in general contraindicated in the presence of focal infection and for two months after eradication. Here, then, is another cause of failure by recurrence.

The spine and lower extremity, too, are concerned in weight-bearing, so making the restoration of normal joint mechanics here of far greater importance than in the upper extremity. This involves stresses being taken along lines indicated by the bone architecture. Passive locking mechanisms requiring minimal muscular effort are regained. Increase in power follows activity of the muscle in normal anatomical posture. An analogy may be drawn from the senile hip in an attitude of deformity. Symptomatology is associated less with the joint lesion than with the resultant deformity. The advanced senile hip lesion when the joint is in good position is frequently symptomless or readily tolerated. Hence, if surgery becomes inevitable in this condition, there is increasing recognition of the field of simple extraarticular procedures affecting improvement in posture.

The tendency of civilization is to promote the inadequate use of joints, and few types of even heavy manual labour entail the general use of all joints. Sedentary occupations lead to minor degrees of malposture. In this regard we have all noted the frequent stretching movements indulged in by animals. Most of us have heard of the American executives who every week or two undergo a spinal manipulation as an economy of time in order to avoid having to play golf. In another sphere we have the analogous use of colonic lavage in the treatment of ailments of the unrestricted epicure.

In manipulation of the spine there is frequently a psychological factor to be considered. But the same indications apply here as elsewhere. The so-called sciatic scoliosis is a relief posture often first adopted by the patient for the relief of pain and persisted in through habit. The malposture itself, apart from the original lesion, then becomes a source of pain. No normal person could long maintain such a stance and remain free from pain. Frequently the original lesion will clear up while the habitual malposture persists. In this case there will be immediate relief from a Haglund's or similar jacket applied in correction. Even when the cause of the original sciatic pain persists, such a jacket gives relief while treatment is directed to the fundamental cause. I am inclined to think that many manipulations of the back would be avoided if this posture, with its consequent adaptive shortening, were prevented or minimized in this manner. The jacket should be retained until the patient has completed treatment for the original lesion. Several such jackets may be used with increasing correction, as adopted in a wedge plaster at the knee. Manipulation may be used after routine treatment only when residual limitation occurs towards the end of the range of movement.

An empirical manipulation is sometimes indicated and, in view of the simplicity of the procedure, might perhaps be used more frequently. There is often a long-standing complaint of pain in movement of a joint, particularly when there is some history of trauma, with no appreciable limitation of voluntary or passive range of movement. In a knee this sometimes vaguely simulates an internal derangement, since there is commonly a history that the knee "gives" or "lets them down". A similar condition is occasionally found at the wrist following an old Colles's fracture.

A typical case history relates to a girl aged sixteen years, seen on May 22, 1935.

> This patient had an old Colles's fracture in excellent position, the fracture line running into the radio-carpal joint. She had sustained a fall from her pony onto her hand about two years previously, when X ray examination indicated a fracture without displacement. Suitable splinting was used for a period of four weeks, and full active movement was gradually obtained during the next month. The patient was very fond of sport, but, owing to a certain degree of discomfort, felt unable to play any games involving the use of this hand. The X ray examination made at the end of two years revealed no sign of the fracture, and the movement was painless and equal in extent to that of the other wrist. A manipulation was performed and not the slightest discomfort has since been experienced in the wrist when the patient is indulging in all forms of sport.

The striking results sometimes obtained by means of these empirical procedures are well known to lay people through the bone-setters, osteopaths and similar practitioners. Their frequent occurrence is undoubted and there has been much speculation as to the rationale of the procedure. One can readily apprehend the breaking down of adhesions or the stretching of an adaptive shortening; but here there is no limitation of movement by which one might presume the existence of either of these conditions. There can also be no doubt that the majority of such cases are not functional, but it does not seem necessary to advance the highly speculative theories given in recent discussions on this aspect of manipulative work.

We know that adhesions may limit movement and give rise to pain. We can explain the fact that a full range of movement may be present, by assuming that the adhesion is not put on the stretch except at the extreme end of the range of movement. Support is lent to this assump-

tion by the fact that during manipulation in such cases a customary technique is to force the joint slightly beyond its normal range, though insufficiently far to cause any damage. Such a movement would stretch or snap any adhesions which merely became taut at the end of the physiological range.

It is interesting to examine the effect of manipulative surgery on hypertrophic osteoarthritis, which is responsible for a wide range of disability in middle and later life. This form of arthritis frequently exists to an extreme degree without inconvenience to the patient, and an X ray examination may reveal an extraordinary amount of bone change. This condition at the knee and at the hip is often found during the routine examination of a patient, who is surprised and incredulous on learning of the advanced state of the lesion.

One would surmise that many of these conditions were of a duration of from ten to fifteen years and more. Such joints frequently become painful after some minor trauma, and rest with suitable splinting is indicated; after subsidence, active movement and, if necessary, assisted movement are carried out to regain the former range of movement.

When normal weight-bearing mechanics are restored there may be little disability from any limited range of movement; but if such a condition is not obtained by conservative means, resort to manipulation is generally very successful.

There is, however, a further and more important source of pain in these cases of advanced hypertrophic osteoarthritis. Over a period of years the patients tend to assume relief postures for the minor aches associated with their condition. Long continued, these postures result in structural shortenings and in the attitudes commonly seen in the person with the senile hip in flexion, adduction and external rotation, and in the knee with flexion contracture. With malposture there is great increase in the pain, and it is well to be clear on the association of this pain with the malposture rather than with the joint lesion. Even though the condition at the joints may be advanced, one is frequently able to give such patients relief from pain by manipulation, sometimes repeated three or four times at intervals of a few weeks, some gain being made at each procedure. Relief may be anticipated if the malposture can be corrected and something approaching normal mechanics be obtained, even though the advanced arthritis remains. When such malposture cannot be changed through manipulative surgery, open surgery is often indicated. But here the knowledge of the association of this type of pain with the malposture has given greater importance to those types of surgical procedures which aim at correction of malposture rather than an attack upon the joint.

An illustration is provided by the following history.

A male patient, aged seventy years, was seen on March 1, 1935, suffering from an extreme degree of osteoarthritis in both hip joints. He had marked deformity on the right side and also to a somewhat less degree on the left. His station work entailed daily inspection work on horseback; his ascent onto the horse necessitated his laborious climbing to the top of a post, and it was only with difficulty that his deformity permitted the astride position. Life was becoming intolerable through constant pain by day and sleepless nights. He was otherwise in good physical condition for his age.

Dr. Vance had seen this patient with me and suggested repeated manipulations first, in spite of the advanced degree of joint change shown radiologically and the very limited joint space. There was little doubt that his joint surfaces were practically devoid of cartilage. Three successive manipulations were performed on this patient at fortnightly intervals, and he received appropriate physical therapy between times. Though his angle of movement was not greatly increased, the malposture was practically overcome; and in the year that has followed these procedures he has been free of pain and sleeps well.

During this time he has kept up his stretching movements. He still reaches his horse from the post, but he rides without pain. The result was largely achieved through the alteration of posture.

In three cases of sacro-iliac pain, unilateral in type and dating from a confinement, excellent results have been obtained from manipulation.

After-treatment is essential following a manipulation. When a complete range of movement has been obtained at one sitting, full movement must be carried out once a day, assisted, if necessary, for a period of from three to six weeks. When manipulation is carried out in stages and retention is not employed, the new range must be maintained. When movement is painful, stretching exercises may be preceded by some form of heat and perhaps a sedative.

When a passive movement has been performed with retention in a new position, rest from movement is indicated, often for as long as six weeks, though it may often be combined with weight-bearing.

The common causes of failure occur when adhesions are allowed to reform after the procedure, when normal mechanics are not restored and maintained, when overmuch has been attempted, and when the ætiological factors in whole or in part have not been or cannot be eradicated.

References.

(1) Robert Jones: "William Mitchell Banks Lecture on the Problem of the Stiff Joint", *The British Medical Journal*, December 5, 1931, page 1019.

(2) R. Pemberton: "Some Considerations Based on 300 Cases of Arthritis Critically Treated", *The Journal of Bone and Joint Surgery*, Volume XVII, October, 1935, page 879.

THE TREATMENT OF CANCER OF THE CERVIX UTERI AT THE ROYAL PRINCE ALFRED HOSPITAL FROM JANUARY 1, 1930, TO DECEMBER 31, 1935.[1]

By Herbert H. Schlink and Clement L. Chapman,
Sydney.

In 1930 the three clinical schools of Sydney agreed to carry out an investigation of the results of the various forms of treatment as applied to cancer of

[1] Read at a meeting of the Section of Obstetrics and Gynæcology of the New South Wales Branch of the British Medical Association on June 17, 1936.

the *cervix uteri*. The Royal Prince Alfred Hospital staff was, as far as possible, to treat patients by the combined method of radium and surgery, the Sydney Hospital staff was to use radium alone, and the Saint Vincent's Hospital staff was to use combined radium and X ray treatment. Uniform records were to be kept in specially designed books supplied by the Cancer Research Committee. It was further agreed that after the first five years the staffs should meet to compare the results of the different forms of treatment used.

We are here this evening to honour that agreement by a preliminary statement of the results we have obtained by the use of radium and operation. As will be readily understood, few absolute five-year results can be given, as another four and a half years will have to elapse before a five-year period will have matured for the whole of the cases.

The statistics we present this evening are those of our own clinic and represent a little more than half the patients with cervical cancer admitted to the Royal Prince Alfred Hospital. Our colleagues, Dr. Reginald Davies and Dr. Arthur Maguire, treated the others and will, I hope, record their results so that the whole work of our institution for the period under review might be published. In the presentation of our results we have included only cases of frank cancer of the cervix which could be clinically diagnosed by the naked eye, contact bleeding *et cetera*, and which were confirmed by biopsy. We have excluded 53 cases of squamous metaplasia of the cervix, regarded by some authorities as early cancer or precancer. These cases were pathologically diagnosed only after removal and form a very interesting group. Any colleague trained in pathological diagnosis will find a wealth of interesting material in these slides, the clinical histories of which have been separately stored for future study and purposes of follow-up. In addition to the Wertheim operations recorded in the present follow-up, we performed many prior to 1930 as well as during the last half-year, but we have excluded them from the statistics presented in order that the comparison between the different forms of treatment may be on a more equitable basis.

Throughout we have used the four-group international classification of the Radiological Commission of the Hygiene Section of the League of Nations (Table I).

Although some clinics would have included the previously mentioned fifty-three cases of squamous metaplasia under the cellular atypia of Group I, we have not felt justified in doing so.

Tables IIa and IIb give the total number of frank cancer cases seen from January 1, 1930, to December 31, 1935, a period of six full years, and the type of treatment adopted.

Table IIa.

Observation.	Number.
Patients seen	203
Patients operable	84
Patients operated upon	89
Operability rate	43·8%

Table IIb.

Method of Treatment.	Number.
A. *Radium + Surgery:*	
1. Radium and Wertheim operation	66
2. Radium and panhysterectomy	1
3. Radium and abdominal cervicectomy	3
4. Radium and vaginal cervicectomy	4
B. *Surgery Alone:*	
1. Wertheim operation	5
2. Panhysterectomy	5
3. Diagnostic surgery	5
C. *Radium alone*	109
D. *Untreated*	5
Total	203

Operability.

It will be observed that out of 203 patients seen, 89 were operated upon, but that only 84 were really

Table I.

Group.	Macroscopic Appearance.	Histological Development.	The Grouping of the Extent of the Growth.	The Symptoms.
I	Nodule.	Cellular atypia.	Clearly localized growth. Normal mobility of uterus.	None.
II	Ulcer or papilloma.	Invasion of basment membrane.	Doubtfully localized. Impeded mobility of uterus.	Contact bleeding.
III	Large ulcer or cauliflower growth with necrosis.	Destructive tendencies.	Invasion of parametria or regional lymph glands. The entire tumour mass is mobile.	Hæmorrhage, discharge.
IV	Crater.	Metastasis, local or distant.	1. Frozen pelvis, with absolute fixation of tumour. 2. Local dissemination to vagina, bladder or rectum. 3. Bladder metastases.	Hæmorrhage, discharge, pain.

operable. In the other five cases section was performed to find out whether radical methods could be used, and either some tissue was removed for pathological examination or some partial operation was done which it was thought would make the patient more comfortable and delay the spread of the disease. The true operability rate in this series was therefore 41·4%.

Radical Wertheim Operations.

Seventy-one radical Wertheim operations were performed, and in five very early cases operation was not preceded by radium. The Wertheim operability rate for the series was therefore 34·9%.

Residual Cervices.

Seven cancers of residual cervices left after supravaginal hysterectomy were removed, all of which had had treatment by radium first. Four were removed by the vaginal route and three by a radical abdominal operation. These last-mentioned operations are much more difficult than the classical Wertheim procedure. Out of 89 cases of cervical cancer, seven occurred in residual cervices, which gives a percentage of 7·85 occurring after subtotal removals. This experience confirms our previously expressed opinion that the classical subtotal hysterectomy should be abandoned and that either total or subtotal hysterectomy with endocervical enucleation should be done whenever it is necessary to remove a uterus. If this had been done as a preventive measure, it means that seven women out of the 89 would never have got cancer.

Panhysterectomy.

Five panhysterectomies were performed without preliminary radium treatment in five early cases. The older teaching considered it safer not to waste time for pre-operative use of radium in these early cases, but we have come to the conclusion that it is time well spent and that every patient should be irradiated before operation. As regards the operation itself, all patients should have the Wertheim operation, except possibly old and debilitated subjects, who would not tolerate a wide removal of the parametria and gland-bearing areas. The more limited removal by panhysterectomy should be reserved for these patients.

Radium Alone.

Those patients who refused operation or whose growths were too advanced for surgical treatment were given radium alone. In this group there were 109 patients, who represented 53·36% of all the patients seen. Those 109, together with the five patients found to be inoperable after the abdomen was opened, and the five whose growths were too far advanced for any treatment whatever, in all representing 58·3% of the whole series, indicate the late stages at which Australian women suffering from cervical cancer apply for treatment. The obvious remedy for this sad state of affairs is to warn all women who suffer from discharge or irregular bleeding, especially those approaching the menopause, to consult a doctor. The mortality will never become less until the patients come under treatment at an earlier stage.

Nearly all the patients treated by radium alone belonged to Groups III and IV. So far we have not had time to follow these up completely, but we feel certain that all except a few of the older women are dead.

Tables IIIA and IIIB show the detail and follow-up of those cases in which radium and the radical Wertheim operation were used. Nineteen patients

TABLE IIIA.

Group.	Number.
Operative deaths	2
Dead	17
Not traced	1
Under observation	46
Total	66

died before the five-year period was reached. The number of years they lived before dying and the stage of the disease at the time they applied for treatment are shown in Table IIIB. There were

TABLE IIIB.

Year of Death after Radium and Wertheim Operation.

Year.	Died.	Group I.	Group II.	Group III.
½	1	—	—	1
1	7	1	2	4
1½	1	—	—	1
2	2	—	—	2
2½	4	—	2	2
3½	1	—	1	—
4	1	1	—	—
Operative death	2	—	—	2
Total	19	2	5	12

two operative deaths; one patient died from embolism on the eighteenth day and one died thirty-three days after operation from pyonephrosis, which was found at *post mortem* examination to be due to a secondary growth high up in the ureter. The abdomino-aortic glands were involved. This was really a Group IV case and was unsuitable for operation. However, it taught us the importance of accurately noting and clinically grouping the conditions found at the first examination, as four or five weeks after radium has been used an inoperable case often seems to be operable, owing to the decrease in the size of the mass. Our operative mortality for the Wertheim operation was 2·8%. There were 46 patients alive and under observation on December 31, 1935, and Table IIIC shows the number of years since they were operated upon and the stage of growth at the time of operation. In this series 46 out of 66 are known to be alive, as the one who is untraced must be classed as dead

until she is found. Eight are alive five years or over.

TABLE IIIc.
Patients Alive at December 31, 1935, after Radium and Wertheim Operation.

Year.	Number.	Group I.	Group II.	Group III.
½	4	—	4	—
1	7	—	3	4
1½	6	—	4	2
2½	2	1	1	—
3	5	1	3	1
3½	9	2	5	2
4	4	—	4	—
4½	1	—	—	1
5	4	1	2	1
5½	3	—	3	—
6	1	—	1	—
Total ..	46	5	30	11

Tables IVA and IVB give the statistics of Wertheim's operation without radium, and show three dead and two under observation. Tables VA,

TABLE IVA.
Wertheim Operation Alone.

Group.	Number.
Dead	3
Under observation	2
Total	5

TABLE IVB.
Year of Death after Wertheim Operation Alone.

Year.	Died.	Group I.	Group II.	Group III.
2	1	—	—	1
4	1	—	1	—
5	1	—	1	—
Total ..	3	—	2	1

One under treatment and alive 4½ years, Group I.
One under treatment and alive 5½ years, Group II.

VB and VC show the results of the treatment of patients with residual cervices. Four patients are dead, three are alive. Table VI shows the results

TABLE VA.
Residual Cervices.

Group.	Number.
Dead	4
Not traced	0
Under observation	3
Total	7

TABLE VB.
Year of Death after Wertheim Operation Alone.

Year.	Died.	Group I.	Group II.	Group III.
Operable death	1	—	—	1
½	1	—	1	—
2	1	—	—	1
4	1	—	1	—
Total ..	4	—	2	2

TABLE VC.
Patients Alive at December 31, 1935, after Wertheim Operation Alone.

Year.	Number.	Group I.	Group II.	Group III.
1½	1	—	—	1
3½	1	—	—	1
5	1	—	1	—
Total ..	3	—	1	2

of panhysterectomy; five patients are under observation; they all belong to Group I; two have been operated on under a year.

TABLE VI.
Patients Alive at December 31, 1935, after Panhysterectomy.

Year.	Group I.	Group II.	Group III.
1	2	—	—
2	1	—	—
3	2	—	—
Total ..	5	—	—

Gland Involvement.

In the 89 patients who were operated upon, the glands were secondarily involved in 19, or 21·3%. All cases were confirmed by pathological section after removal, and in one case an island secondary deposit was found in the middle of the ovary. This percentage of gland involvement is much higher than those reported by other clinics, and indicates that we have been very liberal in the selection of our operable cases. The glands usually involved were the parametrial gland where the uterine artery crosses the ureter, the hypogastric and other iliac glands. In the few cases in which the obturator glands were involved the growth had extended to the upper third of the vagina. The prognosis in these cases is extremely grave, and in our limited experience always meant recurrence.

Syphilis.

In our operative series eight patients were suffering from syphilis (9%), which is rather lower than has been recorded by other clinics. In these cases we always gave a short intensive course of antisyphilitic treatment before submitting the patients to radium and operation. In none of the patients submitted to operation who were suffering from syphilis did we find that the radium lit up the local condition. All showed improvement, but after a much longer time than the non-syphilitics. In one patient who was treated by radium alone the local lesion was aggravated and a pelvic abscess followed. The subject was young and the syphilis fairly recent.

Social State.

In the operative series about 80% of growths were in parous women or women who had had abortions. This indicates that child-bearing, with its cervical lacerations and infections, is an impor-

tant factor in making the cervix the chief site of uterine cancer. Generally it was in the poorer classes of women that this disease prevailed.

Type of Growth.

All but six adenocarcinomata were of the squamous-celled type of growth which displayed in the vast majority of cases the transitional arrangement; a few showed keratinization, and still fewer anaplasia. One was distinctly basal-celled and one had a combination of squamous and columnar cells. This case and the many occasions on which we have discovered squamous-celled carcinomata in malignant growths of the *corpus uteri* force us to Aschoff's belief that once a cell takes on malignant activity it may reproduce itself by either squamous or columnar multiplication. In regard to grading the squamous growths into ripe or keratinized, mid-ripe or transitional, and unripe or anaplastic, our pathological studies convince us that this classification is artificial and unnecessary, as we have many times found all varieties in one and the same growth. A percentage of 6·3 of adenocarcinomata of the cervix is a very high incidence when one compares it with the reports from other clinics.

Age Period.

Only 14 patients were under forty years of age; and only two were under thirty-five years of age, the youngest of these being twenty-five. The vast majority of growths occurred between the ages of forty-five and fifty-five; only six patients were sixty years of age or over; the oldest patient was sixty-seven years of age. These figures confirm the generally accepted view that cancer of the cervix is a disease of the menopause, and any attempt to get patients to attend our clinic earlier must largely depend on persuading women who are about the menopausal age to apply to their doctor for periodical inspection.

Post-Operative Complications.

Out of the 89 patients operated upon, two died after a radical Wertheim operation, one from embolism on about the eighteenth day, and one from pyonephrosis on the thirty-third day, death, as mentioned previously, being due to a secondary growth involving the ureter in the upper part of the abdomen. One patient died from shock after abdominal cervicectomy. The remainder had uneventful convalescences and were up and about in three weeks, except 11, who developed the following complications but eventually recovered:

Bronchopneumonia	2
Pulmonary embolism	1
Temporary uræmia	1
Temporary recto-vaginal fistula	2
Temporary vesico-vaginal fistula	1
Urinary complications	2
Wound complications	2
Total	11

The two wound complications, that is, bursting open and suppuration, occurred in very fat women who returned later for incisional hernias, which were repaired.

Method of Radium Application.

The practice we adopted in most of the cases appearing in these statistics was to find and to dilate the cervical canal, often an extremely difficult and tedious business. We then irradiated the whole length of the uterine cavity by inserting a rubber-covered platinum tube, one millimetre, containing 50 milligrammes of radium. This was left in for 3,000 milligramme-hours. In addition, we placed two corks containing two platinum tubes, one millimetre, with 20 milligrammes of radium each, in the lateral fornices of the vagina, which was then packed tightly with iodoform gauze; the labia were sewn together to prevent its displacement. The vaginal radium is left in for 2,000 milligramme-hours. Thus the patient receives a maximum dose of 5,000 milligramme-hours, screened by one millimetre of platinum. In some of the cases we have given smaller doses when the cervical shell was very thin and the growth close to the bladder or rectum. This is done to prevent burning the vesical or rectal mucosa. In other cases, when the growth was surrounded by a solid collar of uninvaded cervical tissue, we gave much larger doses. Lately we obtained from the Commonwealth radium with two-millimetre platinum screenage, and in the more recent cases we have used the heavier screenage for the vaginal corks. This enables us to give bigger dosages without the danger of inflaming the vaginal, vesical or rectal mucosa. We are of opinion that this heavier screenage for the vagina is a decided advance, as very few of our patients now display the intense surrounding hyperæmia that we used to see on looking into the vagina after use of the lighter screenage. We have had to treat two patients with secondary growth in Bartholin's cyst, and have, after removing the mass of the growth, sewn radium in the wound and left it there for one or two thousand milligramme-hours. The result so far has been good in one case and of no avail in the other. For secondary growths along the base of the bladder we prefer needles, as they are more easily kept in place. Even with the fullest growths we have had few severe reactions after the application of radium. Our plan is to douche the vagina with a one in sixteen solution of peroxide of hydrogen for several days, and when the patient is under the anæsthesia we gently remove all the soft necrotic tissue and paint the vagina with Bonney's blue before placing the radium in position. After the radium is removed the vagina is douched once or twice a day with peroxide of hydrogen, and when an inspection is made four weeks later an inflamed but reformed cervix presents, or a clean, healing ulcer with a slightly purulent base.

Operability and Optimum Time for Surgical Intervention.

Although we have operated on patients from one week to seven weeks and even as long as six to

twelve months after the application of radium in order to study its effect at varying intervals of time, we would advise that operation be undertaken not later than four to five weeks after the application. Before this time the tissues are swollen and œdematous and much bleeding is met with, while, if a longer time is allowed to elapse, the ureters are very hard to isolate, as the tissues become dry, cicatrized and firmly bound down, or in other cases chronically swollen and indurated. Our experience has been that, if done between the fourth and fifth week after the application of radium, the operation is comparatively easy and the bleeding is much less than in a radical operation that has not been preceded by radium treatment. The radium seems to exert an effect on the pelvic vessels, especially the veins, which appear smaller and do not bleed so much when cut across or broken.

As regards operability after radium, whenever the uterus can be freely moved with the parametria pliable and with no obvious fixation to the bladder or rectum, the condition is further investigated by laparotomy to decide whether removal of the growth is possible. Extension onto the vaginal walls is no contraindication to operation, provided the extension is superficial. It is unnecessary to add that patients about to be irradiated and operated upon should be rendered as fit as possible beforehand. Thus if they are very anæmic a transfusion should be given, and if they are syphilitic a short, intensive course of "Salvarsan" and mercury should be undertaken. When they are old and debilitated they should be kept in hospital after the radium application until the Wertheim operation is performed, and during this interval every attention should be given their general health and the strictest local toilet should be maintained. Frequent blood counts should be made to insure that the red count, colour index and hæmoglobin value are within normal limits.

A word might be said here in regard to operating teams. It is our considered opinion that no radical Wertheim operation should be undertaken unless the surgeon has a competent team of assistants and is able to perform the operation under the best surgical conditions. This naturally limits the operation to the big hospitals, but we feel that the general practitioner surgeon in the smaller hospital will suffer no hardship on this account, as the patients who suffer from cervical cancer are usually poor and have little or no money to spend on surgical aid.

Results of Wertheim Operation before the Use of Radium.

Although the pre-operative use of radium has improved the immediate mortality, owing to its antiseptic and sterilizing qualities, the radical Wertheim operation alone has had its successes in the past. From a study of these prior to the routine use of radium after operation we find that seven patients are alive after six years, two after eight years, one after twelve years and one after fifteen years.

Ratio of Cancer of the Corpus and Cervix Uteri.

In the period 1930 to 1935 we have operated upon seventeen patients with cancer of the body, some by radical Wertheim operation and some by panhysterectomy. This represents 19% of all the patients operated upon by us during the period under review.

Radium Alone and Untreated Cases.

In the time at our disposal we have been able to complete the follow-up of those patients only who were subjected to the combined method of radium and surgery, but we hope in the near future to complete the follow-up of those patients treated by us with radium alone during the same period, 1930 to 1935. Even if we had their records this evening, their presentation would have confused the issue before us, as they were practically all Group III and Group IV cases. It is far better that the 89 patients of Groups I, II and III treated by the combined method be compared with the almost identical number treated by radium alone at the Sydney Hospital, as their records will portray the effect of radium on the first and second as well as on the third stage of the disease.

Conclusion.

This meeting tonight is the first attempt made in Sydney, or even in the Commonwealth, to compare the various forms of treatment applied to cancer of the *cervix uteri* by Australian surgeons, and we feel sure that all of us will learn much. We now know the enormous amount of time, energy and money that such a follow-up entails. It seems passing strange to us that no financial provision was made by the Cancer Research Committee to aid this activity, which is the only real source of knowledge regarding the effect of surgery, radium and X rays on this scourge of women. We clinical men not only have to spend our energy on the actual work of consultation and operation and treatment, but are expected, with the help of our hospital laboratories, to bear the expense of the pathological investigation and follow-up. Before the whole of the cancer fund is spent we hope that the committee will provide a well-trained and competent medical man to take care of the follow-up of the interesting case records that the clinicians and busy practitioners have accumulated, and thus, by a presentation of facts and a record of knowledge gained by trial and error, help to solve this vexed problem. No lay secretary has the knowledge to compile this information, although one is necessary to conduct the correspondence in connexion with the follow-up. Furthermore, a special cancer pathologist should be allotted to examine and classify the pathological material in all the metropolitan hospitals engaged on cancer work. Unless some such team is created the cancer fund will have vanished without any real knowledge having been gained of what surgery, radium and X rays can do in the treatment of malignant disease of the *cervix uteri*.

Before concluding we wish to express the hope that each hospital will continue along the lines that it has been following and meet once a year to compare results. This plan should be carried on until we eventually have a reasonable number of ten-year results to dissect, and only then shall we fully appreciate the worth of the various forms of treatment we have on trial.

Acknowledgements.

To Mr. Frederick Chenhall we owe a sincere debt of thanks for the weeks and months he has spent in going through the histories, writing to patients and visiting the Registrar-General. Equally to Dr. Geoffrey Davies and Dr. Thomson we are truly grateful for the careful way in which they have stored and kept in order the pathological sections both of the biopsies and the removed organs, not to mention the time they have spent in going over the slides and demonstrating them to us after each operating day.

EXPERIENCES IN THE TREATMENT OF CARCINOMA OF THE CERVIX UTERI WITH RADIUM AND DEEP X RAY THERAPY AT SYDNEY HOSPITAL.[1]

By Hubert K. Porter,
Honorary Gynæcologist, Sydney Hospital.

Some five years ago, when adequate supplies of radium were made available to the Royal Prince Alfred and Sydney Hospitals, the gynæcological staff of each hospital met and decided on definite lines of procedure. At the former hospital the method to be adopted in the treatment of carcinoma of the *cervix uteri* was to be an initial attack with radium, followed by radical surgery whenever possible, while at Sydney Hospital the initial treatment with radium was to be followed by deep X ray therapy. It was decided that work along these lines should be continued for a period of five years, so that a comparison of results obtained with each method could be made. Tonight sees the presentation of the results of the work during this five-year period.

It has fallen to me to present the results obtaining from this work at Sydney Hospital, and in beginning I would stress that the work belongs to no one member of the gynæcological staff, but is the combined work of Dr. Bowker, Dr. Furber, Dr. Duggan, Dr. Cunningham and myself. The major portion of the work has been in the capable hands of the senior member of the unit, Dr. Cedric Bowker, who has pioneered this work at our hospital.

Possibly the first criticism levelled will be that the number of patients treated is too small for any concrete conclusions to be drawn from the results of treatment. This is admitted, but a beginning must be made somewhere, and although the patients who interest us chiefly tonight (those treated in 1931) number only thirteen, from which little may be deduced, yet there are many interesting points to be noted in connexion with the work, even though most of them may already be well known to us all.

It is quite obvious that our discussion must be only a preliminary to further annual meetings, so that each year's work can come under review in turn, and while tonight the cases of 1931 are of especial interest, this time next year those of 1932 will interest us most, and so on year after year.

At present we base our standard of cure on freedom from the disease and its symptoms five years after treatment, but I feel that we could with advantage raise this period from five to ten years, for there are quite a number of patients who do not survive the disease, even though they are symptom-free five years after treatment. This has been a common experience in all clinics, and I notice that Heyman, of Stockholm, reports 26 patients treated in 1914 of whom seven (or 26·9%) were symptom-free five years later. At the end of ten years, however, only 4 (or 15·4%) were alive. The same worker reports that of 104 patients treated in 1923 there were 25 (or 24%) symptom-free in five years, but at the end of ten years the number had fallen to 20 (or 19·2%); while in 1926, of 140 patients treated, there were 35 (or 25%) symptom-free five years later, but the lapse of two more years saw 7 of these 35 dead, reducing the rate from 25% to 20%.

It seems certain that the work here will show a corresponding diminution in the numbers apparently cured if results beyond the five-year period are considered. In the five years under review the patients treated by us number 86; of these, 13 were treated in the year 1931, 21 in 1932, 11 in 1933, 23 in 1934, and 18 in 1935. You may wonder at these low figures in a central metropolitan hospital like Sydney Hospital. A larger number of patients have been dealt with, and I should like to explain why they have not all been included in the series.

Fourteen patients treated were in such an advanced stage of the disease that radium was not employed, but deep X ray therapy alone was used, it being feared that radium would avail little and would probably hasten the onset of fistula. (I would point out here that in the earlier years there was a tendency on our part to use radium for all patients seeking treatment, even though some were in the terminal stages of the disease, but it is now realized that there is a definite percentage of cases in which treatment along these lines is not indicated.) These fourteen patients have all been seen in the last two years. All were over forty years of age; two only were single and childless, the remainder being married women with two or more children. One cannot be traced, six are dead, five are dying with the pelvis in the "frozen" condition. One claimed that she felt well early this

[1] Read at a meeting of the Section of Obstetrics and Gynæcology of the New South Wales Branch of the British Medical Association on June 17, 1936.

year, but she looked very ill and had deep ulceration of the whole of the left vaginal wall; while the remaining patient, though alive, has involvement of the base of the bladder. We have not included these patients in the series.

All efforts to trace a further seven patients have failed and they have not been included. Some may find this hard to understand, but it will not be so to anyone who has tried to follow up patients when statistics are important. To my mind, women suffering from pelvic cancer not only fail to report early for treatment, but also in many cases fail to appreciate what is being done on their behalf by the "follow-up" department.

The third group which we have excluded comprises thirteen patients. They are all suffering from malignant disease of the *cervix uteri* supervening after subtotal hysterectomy. We have considered these in a separate table, which I shall deal with later, feeling that it is hardly fair to include them in the five-year series, as it is impossible to insert radium into the uterine cavity and thus to obtain the maximum amount of benefit from the treatment. That we have had to treat thirteen malignant cervices occurring in the stump after subtotal hysterectomy during the last five years emphasizes the necessity for total in place of subtotal hysterectomy.

To emphasize this further, I mention one patient, aged sixty-seven years, who had had a subtotal operation twenty-five years ago and who presented herself for treatment with the cervix a fungating mass, the growth extending half-way down the vaginal wall anteriorly, and with a mass in the lower abdomen the size of an orange. Whether we incline to radium or surgery, we all realize how hopeless is the outlook in a case of this type.

The Technique Adopted.

I propose at this stage to describe briefly the technique which we are employing in our work at present. In 1931 there was a tendency on our part to use a smaller dosage of radium than we are using now. At present the technique we are following may be described as that of Professor Regaud.

On admission, all patients are submitted to a routine investigation which includes: (i) a full blood count, especial attention being paid to the red cells; (ii) examination of the urine, especially for sugar; (iii) the testing of the blood by the Wassermann test.

The following conditions are considered contra-indications to the immediate use of radium: (i) a red cell count below 2,000,000 cells per cubic millimetre, (ii) inflammatory conditions of the adnexa, (iii) pyometra.

We employ a general anæsthetic when inserting the radium; this is not considered necessary in many Continental clinics. A vaginal toilet is carried out and a portion of the tumour is removed for pathological examination; the radium is then inserted in an intrauterine applicator and a vaginal applicator. The intrauterine radium is in tubes in tandem (filtration two millimetres of platinum) in rubber, which supplies the secondary filtration. The amount used here is 25 or 30 milligrammes of radium, usually the latter amount. The vaginal radium is inserted in a rubber colpostat with a ten-milligramme tube in each half, and a ten-milligramme plaque is applied over the cervix where possible. The application is made for five days, that is, 120 hours, giving a dose of 6,000 milligramme-hours, or 7,200 milligramme-hours if the plaque is used.

The vagina is carefully packed with gauze. This serves to protect the bladder and rectum and also keeps the applicators in position. To retain the gauze, the labia are approximated with a catgut suture, care being taken to permit easy catheterization of the patient, which is often needed. At the end of the time prescribed the intrauterine radium is easily withdrawn by traction on the attached silk thread.

When it is difficult to find the cervical canal, the application of a small dose of radium or an X ray application will often assist in locating it a week or ten days later. Strict rules in regard to dosage or technique cannot be laid down, for some elasticity must be allowed. Every case must be treated on its merits and as a separate problem after all features of both tumour and patient have been considered.

The second portion of the treatment, the deep X ray application, is now routine. In 1931 very few patients received a full course of X ray therapy for the reason that the plant had not been installed at Sydney Hospital. This application, which is carried out under the supervision of Dr. A. T. Nisbet, is given four weeks after the radium application. The interval between the radium and X ray treatments has been shortened in the last few years, and we intend to shorten it still further.

Deep X ray therapy is given through four pelvic ports, with the addition in some cases of a fifth port (perineal). The dose is usually 2,000 Röntgen units through each port.

A full pelvic course is split up into twenty separate treatments on successive days (Saturdays and Sundays excluded), each treatment lasting about twenty minutes. If a perineal port is added, twenty-five treatments are given. It is often objected that severe constitutional upset follows the X ray treatment. In our experience, about 20% of those treated are affected, but relief can be given in practically all cases. The upset shows itself by gastro-intestinal disturbances, mostly vomiting and in some cases diarrhœa. In one case cystitis was observed as a sequela.

Some patients are affected after the first application, while others are affected after five or six treatments. We have found, as have others, that intramuscular injections of liver extract (two cubic centimetres of "Campolon") have benefited the condition. In some cases it acts like a charm and

checks the disturbance in twenty-four hours, while in others an injection is needed every second day for six or seven injections before the patients are relieved. In one or two cases it failed to relieve the upset.

In not a few cases we found that the administration of liver by mouth was sufficient to prevent the onset of symptoms. In the few cases in which patients suffered from bowel disturbance we found that a mixture of catechu and opium was effective. Several patients suffered from an erythema of the skin with exfoliation and irritation. Applications of lanoline were used in these cases with benefit.

Points of Interest in the Cases.

I should like at this stage to touch on several points of interest as shown from the various series. The age incidence is shown in Table I.

Table I.
Age Incidence.

Year.	Oldest Patient. (Years.)	Youngest Patient. (Years.)	Average Age. (Years.)	Ages of Youngest in Series. (Years.)
1931	75	27	49	27, 34, 39.
1932	71	30	55	30.
1933	64	31	47	31, 32, 40, 41, 42.
1934	62	30	49	30, 30, 34, 38, 39.
1935	82	28	49	28, 37, 37, 37, 39, 39, 40.

While this gives an average age of fifty years for all those treated, the fact that 17 out of the 86 were under forty years of age, while five were thirty years or under, must make us realize that we can expect to find carcinoma of the cervix affecting young women as well as those at or after the menopause.

Married State.—It is of some interest to note that in this list of 86 patients treated, all were married with one exception. Of these 85 married women treated, six only were childless, and one of these had had a miscarriage, while ten had had eight children or more. The average for each case was four children. This is further evidence that carcinoma of the cervix is a disease of *multiparæ*.

Wassermann Reaction.—Of the 86 patients treated, 14 (or 16·5%) gave a positive blood Wassermann reaction. What the relation between this and the malignant condition may be is doubtful, but it seems to support the contention that carcinoma finds syphilitic tissue a fertile soil in which to flourish.

Type of Growth.—Of the 86 patients treated, in 12 the growth was adenocarcinoma in type and in 74 squamous in structure.

Incidence of Fistulæ.—It is not possible to know how many of the patients who have died of the disease developed bladder or rectal fistula before their death, but we have been impressed by the small number of those under constant observation in which these sequelæ were seen. In no case did we feel that fistula resulted from the action of the radium used in treatment, although not a few would probably have been affected in this way had they been subjected to radium treatment. These were cases in the very advanced stages.

Incidence of Pyometra.—Pyometra following the application of radium was much less common than might have been expected. Two patients in the series had this condition when they applied for treatment. In one radium was used after the condition had been dealt with and the patient is progressing favourably, eighteen months later. The second patient became so badly involved while the condition was being treated that radium was not used. Two patients developed pyometra subsequent to our radium treatment, and one required uterine drainage on three separate occasions.

Incidence of Pelvic Peritonitis.—In one patient pelvic peritonitis resulted from the radium application. Fortunately, a localized pelvic abscess followed and it was dealt with by colpotomy with good results.

Menopausal Symptoms.—In all cases in which the ovaries were active menopausal symptoms followed on the radium applications. These varied greatly in intensity and in duration and were mainly vasomotor manifestations, flushes, headache, sweating *et cetera*. Many patients found relief in ovarian extracts, but a few cases were obstinate.

Radium Mortality.—In no case in the five-year series did death result from the treatment, the most untoward complication which may have proved fatal being the pelvic abscess already mentioned. Patients showing symptoms of bladder and rectal irritation were rarely seen.

Stage of Growth.—The classification followed has been that universally adopted and as originally suggested by Professor Regaud and accepted by the League of Nations. (Dr. Schlink has detailed these stages in his paper.)

No matter how carefully the various stages of carcinoma of the cervix are described, the stage into which any particular case falls must always depend upon the personal opinion of the worker treating the patient. The difficulty which arises in classification in the correct group is seen from the following case.

M.M., aged fifty-six years, married, with three children, was seen on November 1, 1932. The cervix was broad and truncated, badly lacerated and stony hard in spots. The rough, ragged centre was filled with friable necrotic new-growth, microscopically adenocarcinoma. There was some thickening of the left vault of the vagina, in which direction the growth was advancing. The left parametrium was somewhat thickened, but the uterus, which was enlarged, was mobile. The case was described as belonging to Stage II. As the enlargement of the uterus was caused by pyometra, radium treatment was postponed and drainage was instituted. Eighteen days later there was still enlargement of the uterus; the left parametrium was definitely involved and the uterus was fixed. Radium was not used, and eight weeks later, on January 31, 1933, the patient died of the disease.

For a true comparison of results the percentage of cures should be arrived at by including every patient who presents for treatment, whether she is treated or not.

The 86 patients treated by us were found to fall into the following groups:

Stage I	1 case
Stage II	26 cases
Stage III	42 cases
Stage IV	17 cases

Results for the Year 1931.

As we had only thirteen cases in the series for the year 1931, I have tabled them in some detail. The classification and the results obtained are seen from Tables II and III.

TABLE II.

Stage.	Number.
I	0
II	4
III	3
IV	6

TABLE III.

1931. Number Treated.	Alive One Year.	Alive Two Years.	Alive Three Years.	Alive Four Years.	Alive Five Years.
13	10 (76%)	7 (52%)	5 (38%)	3 (23%)	3 (23%)

Two patients with Stage II and one with Stage III tumours are living.

As previously mentioned, we were without the plant to give deep X ray applications in 1931, and it is therefore not surprising that only three patients out of thirteen received a full course of this treatment. It is interesting to observe that none of the three patients alive five years after treatment had X ray therapy.

In this year's series there were more patients placed in Stage IV than in any other year. They numbered six. All are dead, and they survived respectively for 4, 8, 10, 14, 18 and 27 months after treatment. I think it very probable that some of these would not have had radium supplied had they been treated in 1935 instead of 1931. As mentioned, we tended to treat all patients applying at that time.

Results for the Year 1932.

During the year 1932 the stages of the patients treated and the results obtained were as shown in Tables V and VI.

TABLE V.

Stage.	Number of Cases.
I	1
II	5
III	11
IV	4

TABLE VI.

1932. Number Treated.	Alive One Year.	Alive Two Years.	Alive Three Years.	Alive Four Years.
21	14 (66%)	10 (47%)	10 (47%)	7 (33%)

One patient with a Stage I, two with Stage II and four with Stage III tumours are living.

Of the twenty-one patients treated in the year, 13 had a full course of deep X ray therapy after the radium application, and of the seven alive at the end of four years, five had had X ray therapy.

In this series the maximum dosage of radium given was 7,540 milligramme-hours, the minimum was 3,500 milligramme-hours, with an average dose of 5,042 milligramme-hours.

Results for the Year 1933.

During the year 1933 the stages of the patients treated and the results obtained were as shown in Tables VII and VIII.

TABLE VII.

Stage.	Number Treated.
I	0
II	2
III	8
IV	1

TABLE IV.

Number.	Name.	Age.	Wassermann.	Married.	Type.[1]	Stage.	Dose[2] in Mgm. Hours.	X Rays.	Treated.	Died.	Remarks.
I	W.A.	75	–	Yes 4.	S.	III	5,668	No.	2/7/31		
II	R.A.	57	+	Yes 2.	S.	II	3,600	No.	5/7/31		2/1/33 vaginal nodule needled.
III	R.M.	59	–	Yes 8.	A.	II	4,032	No.	21/10/31		Developed pyometra.
IV	P.A.	44	+	Yes 0.	S.	IV	2,800	No.	8/2/31	20/4/32	
V	J.D.	39	+	Yes 2.	S.	II	4,200	No.	23/3/31	22/8/33	
VI	S.E.	52	–	Yes 4.	A.	IV	2,825	No.	17/5/31	28/8/33	
VII	P.I.	34	–	Yes 2.	S.	IV	3,360	Unsuitable. Half course.	17/5/31	—/4/32	
VIII	N.A.	44	–	Yes 5.	S.	II	5,710	Yes.	2/7/31	16/10/34	83 para normal. 34 supraclavicular tumour. Secondaries chest.
IX	H.N.	56	–	Yes 1.	A.	IV	3,060	No.	21/7/31	—/3/32	
X	W.A.	50	–	Yes 3.	S.	IV	5,000	No.	21/7/31	4/11/31	
XI	H.R.	27	–	Yes 1.	S.	III	6,772	Half course.	14/10/31	15/3/33	
XII	M.I.	44	+	Yes ectopic.	A.	II	5,025	Yes.	25/11/31	30/12/34	Vesico-vaginal fistula.
XIII	C.K.	69	–	Yes 0.	A.	IV	5,250	Yes.	22/12/31	18/6/33	

[1] A = Adenocarcinoma. S = Squamous type.

[2] Maximum dose: 6,772 milligramme hours; minimum dose: 2,800 milligramme hours; average dose: 4,407 milligramme hours.

TABLE VIII.

1933. Number Treated.	Alive One Year.	Alive Two Years.	Alive Three Years.
11	8 (72%)	5 (45%)	5 (45%)

Two patients with Stage II tumours and three with Stage III tumours are living.

Of the eleven patients treated in this year, all, with one exception, had a full course of deep X ray therapy after the radium application. The patient not treated with deep X ray therapy is living.

In this series the maximum dosage of radium given was 6,620 milligramme-hours, the minimum was 5,000 milligramme-hours, with an average dose of 5,850 milligramme-hours.

Results for the Year 1934.

During the year 1934 the stages of the patients treated and the results obtained to date were as shown in Tables IX and X.

TABLE IX.

Stage.	Number Treated.
I	0
II	7
III	14
IV	2

TABLE X.

1934. Number Treated.	Alive One Year.	Alive Two Years.
23	20 (87%)	16 (69%)

Five patients with Stage II, ten with Stage III and one with Stage IV tumours are living.

Of the 23 patients treated in this year, 20 had a full course of deep X ray therapy after the radium application.

In this series the maximum dose of radium given was 6,720 milligramme-hours, the minimum was 3,870 milligramme-hours, with an average dose of 5,430 milligramme-hours.

Results for the Year 1935.

During the year 1935 the stages of the patients treated were as shown in Table XI.

TABLE XI.

Stage.	Number Treated.
I	0
II	7
III	7
IV	4

Of the 18 patients treated last year, one only has died up to the present time. Sixteen out of these 18 patients had a full course of deep X ray therapy.

The maximum dose of radium given was 8,000 milligramme-hours, the minimum 1,500 milligramme-hours, with an average dose of 4,575 milligramme-hours.

The complete five-year list, 1931 to 1935, is shown in Table XII.

TABLE XII.

Year.	Cases.	One Year.	Two Years.	Three Years.	Four Years.	Five Years.
1931	13	10	7	5	3	3
1932	21	14	10	10	7	
1933	11	8	5	5		
1934	23	20	16			
1935	18	17				

Residual Cervix Carcinomata.

As previously mentioned, residual cervix carcinomata totalled 13. The first in the series was treated in July, 1932, and of them, six are dead (four of these within twelve months of treatment) and one untraced. There were a further two alive early this year, but in a hopeless state from the disease, while four were still alive. These four were treated in September, 1932, February, 1933, March, 1933, and January, 1935.

With regard to radium treatment of this disease, however, it seems that, no matter how the element is applied, there always remains a certain amount of tissue outside the area effectually treated, and should malignant cells be present in this area, the patient will eventually die of the disease unless something further can be done in the way of treatment to deal with these cells. Therefore it becomes imperative that something further should be done to deal with these outside extensions.

At present the most suitable method of attack on the said extensions is by X ray applications through several ports. Although we know that these X rays diminish in intensity the further they travel in the tissues, it is possible to secure a fairly even distribution in the deeper tissues by making the applications in such a way that the beams cross deep in from the surface.

As you know, it has been our practice to use the radium first and the X rays afterwards, but at the present time there are many experts who consider that the procedure should be reversed. They argue that it is more reasonable to attempt to destroy the malignant periphery and then to concentrate with the exits closed upon the central focus by local radium treatment.

Robert McWhirter gives the following reasons for this reversal of treatment:

1. The resolution of the malignant process will increase the elasticity of the tissues of the vaginal vault and so permit the use of a longer applicator and greater displacement of the bowel and bladder from the field of irradiation.
2. The bulk of the growth will be diminished and so the radium will act at a greater depth.
3. It will be easier to find the cervical canal.
4. The most dangerous cells are treated first, while the portion of the tumour to be later treated with radium will not continue to grow, but will actually regress.

5. Sepsis will be cleared up and there will be less danger to the patient when the vagina is packed. This has a further biological importance, for the normal tissues will react better in the absence of sepsis when the massive dose is given locally with the radium, and, in addition, will be less radio-sensitive. As X ray treatment is usually more gradual, there will therefore be less tendency to fistula formation.

6. Time will be given to deal with the general health of the patient, and the blood count can have attention.

He suggests that the radium treatment be given a few days after completion of the course of X ray therapy. He also thinks that X rays control hæmorrhage as satisfactorily as radium. In view of this, it seems peretinent to suggest that someone should at least give this method a trial for a fairly lengthy period so that its advantages or otherwise can, if possible, be determined.

Reviews.

THE TOXÆMIAS OF PREGNANCY.

A volume on the toxæmias of pregnancy—an amplification of the Ingleby Lectures given by Dame Louise McIlroy at the University of Birmingham—comprises a valuable summary of many problems which have proved so baffling in regard to both investigation and treatment.[1]

The opening chapters are concerned with the effect on maternal and infant mortality. In most reports toxæmia is placed next in importance to sepsis, and it is also a predisposing factor in a considerable number of the maternal deaths registered as due to sepsis, shock and other causes. With the exception of abortion, these toxic states, more than any other cause in pregnancy, bring about the death of the viable fœtus.

Then follows a concise summary of the various ætiological factors considered responsible for the condition. It is curious to note that the author does not believe that there is any seasonal variation in the incidence—a conclusion not supported by Australian statistics. The view is expressed that the ovum is the primary factor, and in consequence there is also a loss of balance in the endocrine organs, especially the pituitary, which plays so important a part in maintaining the harmonious relationship between the ovum and the maternal organism. The usual text-book classification of the toxæmias is considered to be useless for practical purposes and is replaced by a description of two types—hepatic and renal. The former is more functional in character and temporary in its effects, while the renal form is organic in type and more lasting and serious in its after-results. Various biochemical investigations are fully described and their respective values are analysed. Special emphasis has been laid on the effect of deficiencies of diet and nutrition in the maintenance of normal pregnancy.

The symptoms, signs and treatment of the various toxæmias are fully dealt with, and there is a special chapter on the ocular disturbances accompanying the condition. In the treatment of eclampsia the author strongly favours the conservative methods advocated by Stroganoff and the Rotunda School in Dublin.

The importance of chronic nephritis is stressed and the difficulties frequently found in establishing a correct diagnosis are clearly explained. The author advocates the induction of abortion in every case of chronic nephritis, and to prevent its occurrence does not hesitate to induce the premature labour of all toxæmic patients responding slowly to treatment. Particular emphasis has been laid on the necessity for post-natal care in all cases of toxæmia, and the author considers that hospital beds should be reserved for such patients.

The volume is an outstanding contribution from the British school of obstetrics by a teacher noted both as a clinician and investigator, and should be on the bookshelf of all teachers and others concerned with the problems of obstetrics.

[1] "The Toxæmias of Pregnancy", by L. McIlroy, D.B.E., LL.D., M.D., D.Sc., F.C.O.G., M.R.C.P.; 1936. London: Edward Arnold and Company. Demy 8vo, pp. 366. Price: 14s. net.

PROSTITUTION.

"Moeurs et Prostitution", by a French author, Marcel Rogeat, forms one of a series of volumes dealing with social questions of importance. Monsieur Rogeat deals in all its aspects with the problem of prostitution, not only as it presents itself in France, but in the United States of America, England, Germany, Italy and Russia. The position of this traffic in France is such that the discussion of the problem of regulation is forbidden ground. Most free-spoken men avoid it, and it is almost impossible to induce any responsible man, whether politician or high official, to talk seriously on the subject. The French have the reputation, rightly or wrongly earned, of discussing sexual matters with a detached calm that amounts almost to cynicism. Yet while a special committee of the League of Nations at Geneva is attempting to frame regulations for the suppression of the traffic in women, French governments, one after another, have refused to take the step of refusing to give official tolerance to houses of prostitution. Nor are matters much better in many other countries included in Rogeat's inquiry. His book, apart from its medical interest, should be of great value to social organizations concerned with this evil.

THE MEDICAL ASPECTS OF CRIME.

Dr. Norwood East is an authority on the medical work of prisons and has an experience dating back over thirty years. He is His Majesty's Commissioner of Prisons and the holder of many other appointments relating to the supervision of criminals and of the insane. His book can therefore be regarded as an authoritative text-book on the subject.[2] Most of the subject matter is reprinted from papers written by the author or delivered in the form of lectures.

The ordinary reader will read with feelings of horror Dr. East's account of the dreadful state of English prisons until long-overdue reforms were instituted in the matter of housing, food and accommodation, and until proper provision was made for the insane. There are also interesting sections on exhibitionism, on the relation of the skull and brain to crime (this latter including a valuable account of the work of Gall, the founder of criminal anthropology), a masterly review of a series of one thousand cases of attempted suicide, and a chapter on sterilization from the penal point of view. Dr. East is of the school which considers suicide a misdemeanour and, as such, punishable by law. He thus opposes the views of those who hold that a man's body is his own, to be treated as he wishes without fear of the criminal code. The Right Honourable Sir John Simon has written a foreword to the book.

[1] "Moeurs et Prostitution", by M. Rogeat; 1935. Paris: Nouvelles Éditions Latines. Demy 8vo, pp. 352. Price: 10 francs net.

[2] "Medical Aspects of Crime", by W. N. East, M.D., F.R.C.P., with foreword by the Right Hon. Sir John Simon; 1936. London: J. and A. Churchill Limited. Demy 8vo, pp. 447, with illustrations. Price: 18s. net.

The Medical Journal of Australia

SATURDAY, OCTOBER 17, 1936.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

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THE MENTAL HOSPITALS OF NEW SOUTH WALES.

The state of the mental hospitals of New South Wales has for several years been a subject for comment in this journal. The reports of Dr. C. A. Hogg, formerly Inspector-General of Mental Hospitals of New South Wales, were so scathing and so insistent on the need for reform (and it appeared that no official notice was taken of his continuous plaint) that the protest made in this journal was of necessity couched in strong language. The first report of his successor in office, Dr. John A. L. Wallace, has come to hand. It covers the year ended June 30, 1935, and is printed under "Number 19 Report from Printing Committee, 23 April, 1936". Dr. Wallace's introductory note to the Under-Secretary of Public Health bears the date October 28, 1935. We cannot help wondering why the printing of the report has been so long delayed. The ways of ministers of the Crown are sometimes strange.

Fortunately there are some bright lights about the report of this year, but much—very much—remains to be done. Last year attention was drawn to the paucity of beds to meet the needs of the large numbers of patients who have to be accommodated. Emphasis was also laid on the danger of the occupation of weatherboard structures at Parramatta Hospital and on the unsuitability of some of the wards at Gladesville Hospital, where many of the patients spend their days looking at blank walls and the sky above, and where there are no day rooms for them. Dr. Wallace does not give many details. He states that some progress has been made in replacing wooden wards by brick buildings, "notably at Parramatta". He adds, however, that other weatherboard buildings are still in existence, "and it is hoped that funds will be found in the near future to also replace these". Our hope is that the hope he refers to is departmental or ministerial hope and not merely that of Dr. Wallace. No mention is made of any effort to correct the state of affairs in the Gladesville wards. Overcrowding of the mental hospitals of New South Wales still exists. The total number of patients resident in the State mental hospitals at the end of the year, including voluntary patients and inebriates, was 10,299, and permanent accommodation was provided for only 9,104, leaving an excess number of patients to the extent of 1,195. During the year 301 new beds were created and 23 more were gained by remodelling; but the number of patients increased by 318, so that for practical purposes the gain in the number of beds for the twelve months was only six. Dr. Wallace states that in previous reports strong representations have been made about the entirely inadequate provision for the criminal insane—"the Department had never been able to carry out its functions, and many persons who should be dealt with in hospitals have been required to remain in gaols". During the year covered by the report an entirely new hospital for criminals has been opened at Morisset. The first ward is completed and occupied; the number of patients accommodated is 24. "With the completion of the hospital much will be done to relieve the conditions to which attention has previously been called." It

is very satisfactory to note that the new hospital at Morisset is situated on an eminence and that, while it provides ample safeguards against the escape of patients, it also allows the inmates to have a view of the surrounding country. "It is very much in contrast with the other Criminal Mental Hospital where the inmates have no outlook but surrounding high walls and sky above."

The most important recommendation in Dr. Wallace's report has to do with the building of a new hospital to accommodate patients coming from the metropolitan area. He points out that the present metropolitan hospitals have practically reached saturation point as far as buildings are concerned, and that to provide for future patients further buildings will have to be made available. Hospitals for patients from the metropolitan area should, Dr. Wallace believes, be situated within a reasonable distance of the city, so that the friends of patients may visit them at reasonable cost and in reasonable time. The visits of friends are not only appreciated by the patients, but are of considerable therapeutic value. Enough has been written to show that the ministerial conscience has been pricked and that the Treasurer has been persuaded to loosen his purse strings. At the risk of repetition we would again point out that the insane are among the most helpless in the community and that by far the greater number of them are not in mental hospitals of their own volition; moreover, they cannot leave the hospital when they will. The powers that be have been aroused; it is to be hoped that they will be galvanized into further action.

Current Comment.

TUMOURS OF THE SPINAL CORD.

Spinal tumours inducing pressure paraplegia may be intramedullary or extramedullary, and the extramedullary type may be either intrathecal or extrathecal. It has been shown that 40% of such tumours are benign, extramedullary and capable of total extirpation. It has been stated that tumours of the spinal cord developing within the vertebral canal should induce a definite series of motor and sensory symptoms. These symptoms would naturally vary with the location of the growth. Clinically, however, the matter is not always so simple as this, and the diagnosis and location of spinal tumours may be bewilderingly difficult. Among the aids to diagnosis is lipiodol injected into the *cisterna magna* through a suboccipital puncture. It has been feared that lipiodol so employed may induce hazards of its own. In practice, however, these perils are not important. In 1916 Queckenstedt commented on the fact that compression of the jugular veins in the neck caused a rapid rise in cerebro-spinal pressure. The application of this phenomenon has been of the greatest use in diagnosing spinal tumour, as, obviously, this phenomenon will not be observed below the level of a tumour. H. Oppenheim subdivides the course of such tumours into three stages. He found that pain occurred in 80% of over 300 cases and that the pain might be in the spinal column at the site of the tumour, but even when the tumour was located high in the spinal canal the pain might be referred to the lower extremities. Usually the pain is referred to the distribution of the posterior roots of the spinal nerves. Peripheral extension of root pain often suggests disease of the pericardium, pleura, biliary, urinary and gastro-intestinal tracts, peripheral nerves, muscles or bones. Pain may be the first symptom and there may be a distinct interval before the onset of sensory or motor manifestations. Pain is generally worse at night and may be aggravated by coughing or sneezing. In the second stage sensory and motor changes appear; the Brown-Séquard syndrome may occur, that is, sensory changes on one side and loss of power on the other. With increase in compression of the cord complete paralysis develops, constituting the third stage.

W. McK. Craig remarks how protean are the manifestations of intraspinal tumours.[1] Such tumours may be mistaken for syphilitic lesions, pernicious anæmia, multiple sclerosis, syringomyelia, sciatica, arthritis, myositis or neuritis. Pain referred to the abdomen may simulate appendicitis, cholecystitis, the twisted pedicle of an ovarian cyst, or fibromyomata. These tumours may produce deformity, such as scoliosis. Craig stresses the fact that the lesion may also be associated with some other constitutional disorder. A complete neurological examination should be made and the Wassermann test and an X ray investigation should be undertaken. Examination of the cerebro-spinal fluid is essential, as, even in the face of a positive reaction to the Wassermann test, a tumour of the cord may be present. Craig instances a case in which the outstanding features were sensory and motor changes prior to the onset of pain. The blood gave a positive reaction to the Wassermann test, but the cerebro-spinal fluid gave no reaction. Amelioration followed removal of a large extradural hæmangioma. Craig remarks that pernicious anæmia is seldom confused with tumour of the

[1] *The Journal of the American Medical Association*, July 18, 1936.

cord, but H. W. Woltman found that 12·7% of patients with pernicious anæmia complained of symptoms attributable to implication of the nervous system. Nervous symptoms may precede the onset of the anæmia. Craig instances a case showing how a tumour of the cord may be mistaken for pernicious anæmia. In this instance neurological symptoms and X ray findings eventually suggested tumour, and a large meningioma was removed at operation. Tuberculosis of the central nervous system also requires consideration. It is usually preceded by a focus elsewhere. When it affects the spinal cord, bony changes are usually demonstrable in skiagrams. Tuberculomata of the cord may exist in the absence of any evident focus elsewhere; they are amenable to surgical intervention when they are extradural, provided the dura remains intact during removal.

Craig states that rapid development of symptoms of tumour of the cord always raises the possibility of malignant disease, but both primary and secondary malignant tumours of the cord are so uncommon that, even in the presence of malignant disease elsewhere, exposure of the tumour to establish the diagnosis is justified. Among the more common general conditions in which tumours of the cord may be confused is arthritis. Often when tumour of the cord is suspected, the only lesion found by X ray examination consists of hypertrophic changes in the vertebræ. Sciatica or pain in the lower part of the back may be the only symptom for a protracted period. It has been stated by E. H. Rynearson and P. S. Hench that, when morphine or codeine is required to relieve the pain of supposed arthritis, tumour of the spinal cord should be suspected.

Craig reminds us that a gall-bladder or appendix is suspected of causing pain that extends to the upper or lower right quadrant of the abdomen and that pain extending to the pelvis may raise the possibility of fibroid or ovarian cyst. But even after such organs have been removed the pain may continue, spinal tumour having escaped recognition. Craig points out that 10% of patients operated on for spinal tumour had previously been operated upon in vain for the relief of pain or other disability. It would appear that the most difficult to diagnose and localize are those tumours affecting the lumbar cord.

LYMPHADENOMA VACCINE.

"There is little doubt that the disease lymphadenoma is the reaction of the human body to some specific pathogenic agent." So begins a description by M. H. Gordon, the author of the encephalitic test for lymphadenoma, of the preparation of a sensitized vaccine of the presumably pathogenic elementary bodies.[1] These particles have recently been observed in vast numbers in lymph glands during the acute phase of the disease. These so-called "Hodgkin bodies" bear a close morphological relationship to the vaccinia bodies of Paschen seen in the active lymph used for immunization against smallpox. As with many bacteria, pseudo-forms and granules of inconstant form occur in some preparations and in control materials. Lymphadenoma is not communicable as such to laboratory animals. Serum from lymphadenoma cases mixed with a suspension of these granules from lymphadenoma glands seems to cause flocculation results which are absent with control sera and antigen. This flocculation test has been applied eighteen times, but the results are not consistent or strong enough for diagnostic purposes. Gordon hopes that better results will ensue from a precipitin reaction, such as seems to be possible with a certain fraction of the vaccinia and psittacosis viruses. In the meanwhile progress has been made with an attempt at therapeutic application of vaccines of the elementary bodies. Gow has pointed out that lymphadenoma patients are hypersensitive to an attenuated form of the vaccine, such as occurs in certain bacterial infections. Gordon states that this hypersensitivity has been repeatedly shown, in the case of acute bacterial infections, to be abolished by combining the infective agent with its specific antibodies, that is, by sensitizing it. This has been done with rabbit serum to the elementary bodies under consideration. The vaccine is prepared by allowing the bodies to remain in contact with the inoculated rabbit's serum for an hour or two at body temperature and then overnight at room temperature. The vaccine is then washed, and, when administered at short intervals, excites no reaction.

Gordon gives full technical details in his paper of the mode of preparation of the sensitized vaccine and of the method of standardization. So far as possible, an attempt has been made to prepare such an homologous sensitized vaccine for each lymphadenoma patient. This may take some weeks, and if urgency is called for, a stock vaccine from several patients with lymphadenoma could be used. The first object is, of course, to ascertain whether in suitable cases the administration of the sensitized vaccine of the flocculated elementary bodies, autogenously prepared, is followed by clinical improvement or not. Gordon points out that no dramatic recovery should be expected, as the method is designed to stimulate the patient's own specific resistance, that is, to accelerate the natural immunizing mechanism.

The disease lymphadenoma is of a persistent and malignant character, and even if improvement occurs with the present form of treatment, the further problem of maintaining such improvement will arise. Obviously the stage of the disease and the age and condition of the patient will also be important factors. Gordon does not yet supply the clinical results so far obtained, but all who have had the care of patients suffering from this ruthless disease will eagerly await their appearance.

[1] *The Lancet*, July 11, 1936.

Abstracts from Current Medical Literature.

OPHTHALMOLOGY.

Exophthalmos from Sinus Infection.

M. Cohen (*Archives of Ophthalmology*, March, 1936) describes four cases of inflammatory exophthalmos from sinus infection. Twenty-two out of 1,517 patients with sinusitis suffered from this condition. In mild cases the exophthalmos is due to inflammatory œdema of the retrobulbar tissue, and responds well in a few days to treatment. The first patient, a man, aged fifty-one years, was admitted with acute ethmoiditis, left exophthalmos and fever. He died after three days. In the second case, vision was normal and there was exophthalmos of 10 millimetres on the left side. Treatment was first by cold and later hot compresses and nasal treatment by ephedrine spray and suction. In four weeks he was cured. The third patient was a man, aged fifty-three years, with chronic purulent sinusitis. The right eye was normal, but there were exophthalmos and chemosis of the left. Kronlein's operation was performed to relieve tension. The exophthalmos was not relieved. Exenteration of the ethmoidal sinuses was then performed. Five years later there was no proptosis of the left eye; but there was of the right eye. The patient refused further treatment. The fourth patient had exophthalmos of 35 millimetres in the right eye and 23 millimetres in the left. A Kronlein operation was performed on the right orbit with no effect. A month later this patient returned with keratitis of the left eye, and a Naffziger operation was performed; that is, removal of the orbital roof. There was no immediate improvement; but a year later a better result was evident.

Malaria Therapy in Syphilitic Optic Atrophy.

C. P. Clark (*Archives of Ophthalmology*, February, 1936) makes a further report on the effects of treatment with tertian malaria upon patients with optic atrophy of syphilitic origin. He gives the record of twelve patients, eight of whom suffered from *tabes dorsalis*. In eight cases there was improvement. One patient, a young negro woman, resistant to tertian malaria, was given injections of typhoid vaccine instead.

Epithelial Downgrowth after Cataract Extraction.

D. Vail (*Archives of Ophthalmology*, February, 1936) advises irradiation for the rare condition of epithelial downgrowth into the anterior chamber after cataract extraction, which ultimately results in glaucoma and loss of the eye. The diagnosis can be made by careful and repeated biomicroscopic studies, especially when glaucoma follows cataract extraction. The essential point seems to be a cloudy veil developing down from the wound on the posterior surface of the cornea and the front of the iris. It occurs after delayed healing and with entanglement of capsule in the wound. A case is reported wherein a radium plaque 1·6 centimetres square, containing 15 milligrammes of radium, and covered with a thin Monel metal screen and one millimetre of rubber was applied directly to the eyelid over the area involved and left on for two hours. The result was favourable.

Anisophoria.

J. S. Friedenwald (*Archives of Ophthalmology*, February, 1936) defines anisophoria as that form of heterophoria in which the degree of muscular imbalance of the eyes varies with the direction of the gaze. It occurs in the presence of paresis or spasm of one or more muscles. Correction by prisms may leave uncorrected heterophoria of opposite signs in opposite quadrants of the field. A second group comprises cases in which anisophoria is produced by the correction of anisometropia with lenses which have a different peripheral prismatic effect for each eye. There is a physiological anisophoria as in the case in which one fixes an object down and laterally. The nearer eye rotates downwards through a larger angle than the farther eye. The apparatus and methods of detection and measurement are described. One form of treatment is the use of meniscus lenses of no dioptric value, but with a peripheral prismatic effect.

Heterophoria.

A. Bielschowsky (*Archives of Ophthalmology*, April, 1936) admits that it is not known why various subjective disorders, as eye-strain and headache, may result from slight degrees of heterophoria or astigmatism, whereas the majority of patients with a higher degree of the same anomalies do not complain of any discomfort. Many of the sufferers show a neuropathic constitution or have endured some psychic shock or physical exhaustion. Statistics have proved that heterophoria and ametropia occur in more than 80% of cases; that is, they must not be considered unconditionally as pathological conditions; but emmetropia and orthophoria may be considered ideals as a starting point for the discussion of their variations. When through injury or disease one eye becomes amblyopic, binocular vision is abolished and strabismus of different kinds and degrees develops. The usual tests for heterophoria do not completely relax the fusion innervation and fail to reveal the whole amount of latent deviation. Even Marlow, after prolonged occlusion, obtained contradictory results. The so-called "prism duction" test is the only one that almost completely relaxes the fusion innervation. There is very often a variation of the result from day to day, and a test performed only once may lead to wrong conclusions. The author is sceptical about deviations of less than one prism diopter; he is also sceptical about the anisophoria described by Friedenwald. Anisophoria can be corrected by a meniscus lens of no dioptric power, but with a peripheral prismatic action. Such lenses have been developed to correct aniseikonia, and were described in 1932 by Ames, Eliddon and Ogle.

Extraction of Cataract by Electro-Coagulation.

M. Khalil (*The British Journal of Ophthalmology*, March, 1936) describes the history of the electro-coagulation method of intracapsular extraction of cataract, and gives details of the appliances and technique of Lacarrère, of Madrid. This operator employs a Siemens apparatus using a current of 90 milliampères. The handle of the electrode consists of a capillary glass tube carrying two steel wires 0·14 millimetre in thickness. These wires can be made to protrude two millimetres or more by the operator's pressing a spring button on the handle. There is also an interrupter of the current worked by the operator's foot. The capillary tube is applied over the anterior surface of the cataract; the operator starts the current by pressing the foot pedal, at the same time allowing the wires to project by releasing the hand button; one second later he shuts off the current by releasing the pedal. In this manner the cataract is made to adhere to the electrode and so is withdrawn from the eye. No pressure is put on the lens by the needles; the way is opened for them by the electric spark. It is very important to get the exact strength of current required.

Ectopia Lentis.

F. E. Burch (*Archives of Ophthalmology*, April, 1936) describes Marfan's syndrome, and reports eight cases. Arachnodactyly, or spider digits, derives its name from one of the hereditary or familial features; namely, the long thin and tapered claw-like finger ends, which characterize the disease. The principal skeletal changes occur in the long bones, the spinal column and the bones of the hands and feet. The affected children are noted for their tallness; but their weight is below normal. Muscular tissue is poorly developed and adipose tissue absent. The heart is affected in a large number of cases. Ocular complications are those associated with *ectopia lentis*—iridodonesis, small contracted pupils, and anterior chambers of uneven depth. They are present in from 33% to 50% of cases. The dislocation of the lens is bilateral, incomplete, and mostly upwards. An hereditary or at least a familial origin is undoubted.

Vitamin C and Cataract.

J. Bellows (*Archives of Ophthalmology*, January, 1936) quotes Muller and Buschke as saying that the

vitamin *C* content of the human lens and aqueous humour is 30 and 12 milligrammes per hundred cubic centimetres respectively. Farmer determined the vitamin *C* content of normal blood plasma to be between one milligramme and two milligrammes per hundred cubic centimetres. The origin of cevitamic acid in the lens and aqueous humour is unknown. F. P. Fischer believes that dextrose reacts with cystin in the lens to form cevitamic acid and cystein. Experimental study by the author showed that the average vitamin *C* content of the blood plasma of 20 patients with cataract was 0·605 milligramme per hundred cubic centimetres, as against 1·02 in normal subjects. There is also absence or diminution of cevitamic acid in the aqueous and in the lens of cataractous eyes. Vitamin *C* is being given to subjects with incipient cataract in order that its influence may be observed.

OTO-RHINO-LARYNGOLOGY.

The Fronto-Ethmoidal Operation.

WALTER HOWARTH (*The Journal of Laryngology and Otology*, June, 1936) gives some modifications in the technique of the fronto-ethmoidal operation suggested by himself in 1921. In recent years it has been found possible to curtail the outward extent of the incision, and, by bringing it still further under the orbital margin, to improve the scar, which becomes, indeed, almost invisible. Very often troublesome bleeding occurs from the angular vein and from small ethmoidal vessels deep in the wound. This may be considerably diminished by infiltration of the subcutaneous tissues twenty minutes before operation with a 1% "Novocain" solution and by painting out the nose with cocaine paste. For the injection of "Novocain" the needle should be passed deeply along the *os planum* of the ethmoid under the periosteum, as well as in other directions. It has been found unnecessary in the majority of cases to remove the whole of the outer part of the floor of the sinus. This, together with the limitation of the incision, does away with any excessive displacement of the orbital contents and avoids undue disturbance of the pulley of the superior oblique and the supraorbital nerve. The opening into the nose should be a large one, and should be brought forward by removal of portions of the nasal process of the frontal bone and the ascending process of the superior maxilla. This is best effected by the use of a straight chisel. In the removal of the ascending portion of the superior maxilla a disconcertingly large piece may come away, but if this should happen it need not cause much concern, as it causes no deformity and insures a wider opening into the nasal cavity. At this stage the operator should pay further attention to the anterior portion of the ethmoid in order to make certain that no small fronto-ethmoidal cell lies between the septum and the new fronto-nasal duct. If this cell should remain unopened it might at some future time produce a polypus and block the drainage from the sinus, either partially or completely. The whole success of the operation depends upon the patency of the new fronto-nasal duct. The author did not begin to use flat skin grafts applied to the orbital surface until after their use had been suggested by various Continental surgeons. His method is to cut a graft from the thigh. He states that it is helpful if the skin from which the graft is to be taken is previously painted with collodion, as suggested for mastoid grafts, as then the edges of the graft do not tend to curl. The graft is laid on the orbital tissues, one end up to the sinus and the other end down into the nose, whilst a portion extends backwards towards the sphenoid and forwards towards the skin incision. The graft is covered with a tissue called "Protective", which has been in use at Saint Thomas's Hospital for more than thirty years for the covering of Thiersch grafts. This helps to keep the graft in place. Oiled silk or *tulle gras* may be used instead of the "Protective"; but they are rather slippery and do not adhere so well. A large rubber drainage tube with fairly thick walls is passed up into the sinus and down into the nose. This lies against the graft and helps also to keep it in place. The end of the tube that comes out of the nostril is sutured to the columella and is retained for eight days. A probe should be passed up the tube from time to time to insure that no secretion is dammed back in the sinus. The skin incision, which is sutured with fine horsehair or waxed silk, heals by first intention.

Electrical Hearing Aids.

HENRY E. HARTIG AND HORACE NEWHART (*Archives of Otolaryngology*, June, 1936), in a paper dealing with the qualities of instrumental hearing aids, conclude that among the various ones on the market having as components a carbon microphone, a carbon amplifier and an ear-fitting receiver, there are important differences in the amount of amplification produced and tremendous differences in the intelligibility ratings. The differences in performance do not depend measurably on the observed non-uniformity of response. In consequence, the furnishing of frequency response curves to the otologist with each hearing aid would be of no value. Of greater importance are a wide range of response (as a minimum from 200 to 3,000 cycles per second), freedom from singular peaks of amplification, and sufficient amplification. Of paramount importance is the actual aid that the user obtains in interpreting speech sounds and sentences correctly. Hearing aids having a low intelligibility rating were also found to produce the greatest volume of noise by-products due to non-linear distortion. It is concluded that these noise components are the principal cause of the poor intelligibility. Portable hearing aids consisting of a carbon microphone and receiver only are largely ineffective because of insufficient amplification. At present probably the best means of determining the usefulness of a carbon microphone hearing aid of known merit for a given person is the discrete sentence intelligibility test. Tests made with bone conduction oscillators indicate that the relative merit is not appreciably affected by the substitution of bone conduction for air conduction when carried out on persons with normal bone conduction.

Carcinoma of the Tongue.

FRANK R. SPENCER (*Archives of Otolaryngology*, July, 1936) discusses carcinoma of the tongue and gives a review of fourteen cases. The disease is recognized earlier. Broders's classification is a help in outlining treatment. Surgical diathermy is an improvement on cauterization, although it has not displaced and should not displace cauterization entirely. Irradiation by high voltage X rays is an improvement over low voltage irradiation, just as the application of a radium bomb or teleoradium is an improvement over the use of small quantities of radium. The recognition of the importance of syphilis of the tongue in causing cancer, and of carious teeth with poor dental hygiene, will do much to prevent and relieve the suffering from lingual carcinoma.

Bronchoscopic Studies of Abscess of the Lung.

IRVINE B. GOLDMAN (*Archives of Otolaryngology*, April, 1936) deals with the bronchoscopic findings and their interpretation in cases of abscess of the lung in the acute, subacute or chronic stage. Bronchoscopy is not utilized merely when it is suspected that a foreign body is present in the bronchus. The most reliable single bronchoscopic sign of pulmonary abscess is the escape of foul pus from the mouth of the bronchus. The pus from a putrid abscess of the lung is usually not so profuse as that from bronchiectatic cavitation. Occasionally in the early stage a foul odour is perceptible, but pus cannot be found. Among other causes, the absence of pus may be due to œdema about the orifice of the bronchi. The author concludes that the experiences cited with bronchoscopy reveal its best application in the diagnosis of abscess of the lung at its various pathological stages. The diagnosis can be made before the expectoration of pus; it offers aid in finding and removing the causes of abscess of the lung; it helps the surgeon before operation by accurately localizing the site of the involved broncho-pulmonary segment which lodges the abscess cavity, and it is valuable in determining the course of the surgically treated pulmonary lesion.

XUM

British Medical Association News.

SCIENTIFIC.

A meeting of the Victorian Branch of the British Medical Association was held on August 5, 1936, at the Medical Society Hall, East Melbourne, Professor R. Marshall Allan, Vice-President, in the chair.

Manipulative Surgery.

Dr. C. H. Hembrow read a paper entitled "Manipulative Surgery" (see page 517), and illustrated it with a moving picture of the technique.

Dr. C. W. B. Littlejohn, in opening the discussion, emphasized the great interest of the subject of manipulative surgery and its importance to the medical profession. He expressed his gratitude to Dr. Hembrow for his lucid address. The general idea presented appeared to admit of very little argument; but Dr. Littlejohn failed to agree with Dr. Hembrow on a number of minor points. Dr. Littlejohn commented on the frequency with which he himself had encountered statements from patients that they had consulted osteopaths and other non-medical manipulators after failing to get relief as the result of consulting "every doctor in Melbourne". Dr. Littlejohn thought that errors in diagnosis were frequent, and if, in spite of these errors, treatment was successful, it must be purely a matter of accident, and it was not surprising that failures were common. He thought that the error lay in a very widespread misconception of the causation of somatic pain. Because pain was transmitted by the nerves and felt by the brain, there was a liability to interpret every pain that had no obvious cause as due to some direct interference, by pressure or by inflammation, with the nerve trunks; that was why so much was heard of neuritis, which, apart from certain cases of alcoholism, diabetes, leprosy, and other less common causes, was probably an unknown disease Dr. Littlejohn pointed out further that pain was not a prominent symptom of real neuritis except in circumstances such as the actual pressure of leprosy nodules on the nerve. When there was nerve pressure, such as caused by a cervical rib, and the well-known conditions in the radial, ulnar and median nerves due to old injuries to the arm and elbow, motor signs always accompanied and generally overshadowed the pain symptoms. Dr. Littlejohn said that it was hopeless to diagnose a condition as brachial neuritis and speak of curing it by manipulation of the neck or shoulders, or to diagnose sciatic neuritis and propose to cure it by manipulation of the spine. Dr. Littlejohn said that medical men often adopted the attitude that they had seen many patients with neuritis and had treated them by rest or immobilization or by heat and internal remedies, and that the patients had recovered; while agreeing that some of them recovered, Dr. Littlejohn thought that they had recovered not from neuritis, but from skeletal lesions, which had caused the pain. It appeared to be the root of the matter that all, or nearly all, of these obscure pains were referred, according to the so-called law of Hilton, from a part of low sensitivity to a part of high sensitivity; on no other supposition could one correlate the clinical features of pain, paræsthesia, tenderness, atrophy of disuse, and normal electrical reactions.

Dr. Littlejohn went on to say that the joints were the keystone, and that the sensitive structures in and around the joints were the capsule and the musculo-tendinous junctions in the vicinity; but these were areas of low sensitivity. Pain caused by tension which might be purely mechanical or might be due to inflammation, would be referred to the area of high sensitivity supplied by the nerves of the same segments as the joint. As a general rule, it could be taken that a joint was supplied by the same nerves that innervated the muscles in its immediate neighbourhood; Dr. Littlejohn thought that the wider theory that a joint received a twig from the nerve of every muscle that moved the joint was rather far-fetched, and he took as an example the shoulder joint, which received twigs from the circumflex and the musculo-cutaneous nerves, the radial or musculo-spiral nerve, and possibly the ulnar. Pain due to shoulder joint lesions would therefore be felt practically all over the limb and also in the supraspinous regions; the main point of reference was over the joint near the greater tuberosity, at the insertion of the deltoid, and in the fingers and palms. Other tender spots might be found corresponding with the endings of the nerves that supplied the joint. Pain could be elicited by movement of the joint; but if the joint were held perfectly still by an appliance and not by muscular exertion, the pain rapidly disappeared. This would not occur if there was an inflammatory lesion; therefore, the form of treatment that depended upon absolute rest had been evolved for such cases. If the lesion were of the nature of an inflammatory periarthritis, due probably to an actual deposition of non-pus-forming cocci in the poorly vascularized tissues, rest was beneficial up to a point. As the pain diminished and activity was resumed, the soft adhesions were stretched, and recovery took place; but if rest were allowed for too long, the adhesions became firmer and would probably limit the excursion of the joint. If the lesion were initially mechanical, due to a sprain or strain, which meant that for some reason the joint had over-reached its normal excursion, there would be tearing and effusion in the ligaments and perhaps, in the case of tight joints, in the musculo-tendinous junctions as well. In such cases rest was permissible for a minimum time, and then graduated movements should be commenced. In the shoulder a common third cause of symptoms was concussion of the joint; this frequently followed a fall on the hand or a blow on the shoulder, such as a bump at football. It would appear that the articular cartilage was bruised; but as this was an insensitive structure, there was no pain; the cartilage fibrillated, some fluid formed in the joint and fell to the lower parts of the joint and into the looser anterior folds, and there it might organize and form adhesions, which were truly intracapsular. Dr. Littlejohn indicated that the same process might happen in the knee joint, and went on to say that if there was a period in treatment in which a sling was used, very serious limitation of movement might occur, and that in all such cases, if adhesions were permitted to form, there would be pain on movement, and this pain would radiate to the appropriate spots. In view of these facts, cure was only likely to be obtained by manipulation, gradual or sudden. These were the conditions responsible for the pain; they were definitely amenable to treatment by manipulation, and should be attacked by this method.

The clinical condition so often called sciatica typically caused pain in the buttock and outer side of the thigh and legs; perhaps the pain might affect the calf or the dorsum of the foot, but rarely the sole. This was not the distribution of the sciatic nerve; the sciatic nerve did not supply the buttock, and the pain was not in its whole distribution; it was rather in the distribution of fibres from a segment of the cord.

Dr. Littlejohn had often heard the interesting theory that the nerve was pressed against the bone, giving rise to the pain; but actually the pyriformis muscle formed an arch over the nerve and protected it. The trouble usually arose from the sacro-iliac and lumbo-sacral joints, and the joints between the articular processes of the fourth and fifth lumbar vertebræ; the pain was referred to the areas innervated from the corresponding segment, with radiation to adjacent segments. In conditions of obscure pain Dr. Littlejohn advised that one should look for lesions of the joints and not of the nerve trunks. He also mentioned that the limitation of movement in sciatica was not always in full flexion, but sometimes only when the patient stood upright.

Dr. Hembrow had covered the field of the technique of manipulation; but Dr. Littlejohn thought that, in the film that had been shown, the movements seemed to be carried out very gently and much more gently than he found necessary to effect a cure. Dr. Littlejohn also thought that it was important to consider the mental outlook of a patient before embarking on manipulative

treatment. One sort of patient would be willing to help by carrying out the exercises after manipulation faithfully and with fortitude; the other sort would complain of the pain, often very bitterly, and refuse to carry out the exercises. Manipulation of the shoulder was painful, and the exercises were painful, and if the patient was not prepared to go through with it, it was better not to start. Dr. Littlejohn said that some little adhesions could be broken down quite satisfactorily without the administration of an anæsthetic, and indeed the cooperation of the patient often helped in the determination of when adhesions had been broken down.

Dr. Littlejohn questioned some of the statements that Dr. Hembrow had made. The pain attributed to deltoid adhesions he regarded as pain referred from the shoulder joint, and in disorders of the shoulder this localized pain was invariably present. In his reference to rotation of the knee, Dr. Hembrow had stated that there was no muscular action governing it; but Dr. Littlejohn had found that if a patient was not given a general anæsthetic it was a difficult manipulation to carry out, on account of the patient's opposition. There were muscles that held the knee joint against the movement of rotation. He could not agree with Dr. Hembrow on the subject of "tennis elbow"; but he would not go into details, as he recognized that the subject was controversial.

Dr. Littlejohn said finally that he had found that it was unsatisfactory to attempt to manipulate the coccyx, and when he felt that the coccyx was the origin of the symptoms, he generally took it out.

Dr. Leonard Cox, after congratulating and thanking Dr. Hembrow, said that to a certain extent Dr. Littlejohn had stolen his thunder. Chronic and persistent pains were a bugbear and were apt to occur in every segment of the body. The patients, at times, seemed to manufacture or magnify trivial complaints, and many drifted into what was diagnosed as neurasthenia. Pains in the region of the upper cervical nerve were a fruitful source of trouble. He had been introduced to the importance of searching for the origin of referred pain and to the value of manipulative treatment, by the case of a woman, thirty years of age, who had consulted him some ten years earlier. She complained of recurrent and severe occipital headache, of two years' duration. It had followed a rather trivial injury, and she was a psychasthenic type of woman. He had investigated the condition carefully, and as the result of certain indefinite appearances in the skiagram that suggested an abnormality in the neighbourhood of the axis, he had called upon Dr. Trumble to carry out manipulative movements of the head on the neck. The pain had disappeared after an audible snap while the movements were being carried out, and had not reappeared since. It should be remembered that upper cervical arthritis might be referred to the first division of the fifth cranial nerve. Another patient of his, a woman, aged thirty-two years, had complained of persistent headache for five years. After investigation, operation on the pituitary gland had been suggested. Dr. Hembrow got a dramatic result by manipulative treatment.

In the group of patients suffering from so-called brachial neuritis, he agreed heartily with what Dr. Littlejohn had said concerning the way in which the pains were referred; but he thought that interstitial neuritis was not quite so uncommon as had been suggested by Dr. Littlejohn. He hoped he would be forgiven if he referred to another patient, a man, aged fifty-two years, whom he had seen a few months earlier. This patient had had three attacks of severe pain radiating down from the shoulder to the hand and middle finger, aggravated by bending the head forwards. During the last attack he had been in constant pain, for which he had required injections of morphine. Dr. Hembrow had then broken down the adhesions, and a few days later the patient had been able to return to work.

There were a number of other allied conditions in which the diagnosis of pleurisy or of angina, or even of an acute abdominal condition, had been made, which had been found ultimately to be examples of spinal arthritis. Dr. Cox considered that one should bear this possibility in mind whenever persistent pain was not explained satisfactorily. It was important to ascertain whether the pain was aggravated by any particular movement, and a patient search should be made for tender spots, for their presence was often of diagnostic value.

Dr. Jean Macnamara said that she desired to emphasize the need for the careful selection of cases for manipulative treatment. When the type of case was satisfactorily determined, the possible danger of the treatment had to be taken into account. She also wished to point out that the actual manipulation should be only a small incident in a well-planned *régime*. While she was abroad she had heard in America favourable comments on the fact that a general meeting of the British Medical Association had been devoted to "chassis troubles" as opposed to "engine troubles". She did not remember having received any lectures on "chassis troubles" when she was a medical student, and hoped that more attention was paid to them nowadays.

Dr. A. E. Coates said that Dr. Hembrow had contributed some excellent material on "greasing shackles" in his address, which he had followed with great interest. He would like to ask Dr. Hembrow to comment further on the radiological appearances of joints before manipulation. Dr. Coates realized that nasty accidents could occur; a warning about the likelihood of their occurrence might be obtained by a careful and close examination of the skiagram before manipulation was undertaken. Dr. Coates mentioned one case in which the head of the humerus had been shattered, and another in which the shaft of the humerus had been broken. He also referred to a case of brachial neuritis following manipulation by an osteopath; the manipulation had caused a lesion of the brachial plexus. He feared manipulation and did not undertake it himself. He referred patients requiring this procedure to an expert; but first he ascertained that appearances of rarefaction or of softening were absent from the skiagrams.

Dr. John Kennedy said that he too was grateful to Dr. Hembrow. At the Alfred Hospital an effort was made to practise manipulation in the treatment of old chronic spondylitis. He sought information about post-manipulative treatment, particularly in lesions of the shoulder joints. In this condition the patient was liable to have considerable pain and reaction after the treatment. He would like to hear a pronouncement about the proper position to put the limb in after treatment. He had formed the impression that the post-manipulative trouble was exaggerated if the manipulation was carried out too early after the injury, and if the arm was kept in a sling at the side and not in a fully abducted position. He would also like to get an explanation of the success osteopaths obtained in their treatment of "ricked back" or "ricked neck".

Dr. John Colquhoun said that he had listened with great interest to the paper and to the discussion. He wished to congratulate Dr. Hembrow on the way that he had presented the subject. Dr. Colquhoun thought that he was not able to go all the way with the previous speakers. It must not be forgotten that H. O. Thomas, who was descended from bone-setters, was the prophet of rest. Concerning pain, Dr. Colquhoun said that he was in the camp of Dr. Littlejohn. Some pain was relieved by manipulation and some by rest; cervical arthritis could be relieved either way. The Thomas collar had proved very effective in acute arthritis of the neck. Dr. Colquhoun thought that some of the manipulations he had carried out had been followed by worse pain than the original. He thought that the theory of the snapping of adhesions was open to doubt, and he could not understand why adhesions should form; he preferred to call the stiffness "adhesiveness" rather than "adhesions", and he believed that the body could get rid of this adhesiveness if the part was placed at rest. Thomas had cured many a "low back" pain with plaster made of waxes, tar and brown paper. The cures by manipulation could be explained on the assumption that during the manipulation the products that caused adhesiveness were carried off. Success could be obtained by both methods in the treatment of painful feet. Thomas had employed his well-known

wrench to break down all obstructions in the way of the mobility desired. The feet were then placed in plaster of Paris, with the bones carefully moulded into the correct position. Later, with reeducation, cures were obtainable and the patients could walk without pain. In conclusion, Dr. Colquhoun said that, in the technique of manipulation, considerable force was required, and it should be remembered that there were other methods of treatment by which cure could be effected.

Dr. W. Ostermeyer said that he could not understand why, if the pains of cervical or spinal arthritis were due to adhesions pressing on nerve endings when the joints were moved, important nerve endings were not lacerated more frequently when the adhesions were broken down by manipulative treatment. He would also like to know if the after-pains were due to the same pathological process as the original pains, and whether there was any explanation of the failure to form fresh adhesions as the result of the traumatism caused by the manipulations.

Professor R. Marshall Allan thanked Dr. Hembrow for his paper and for the film he had shown. He remarked that the sacro-iliac region and the coccyx were bugbears to the gynæcologist as well as to the general surgeon.

Dr. Hembrow, in reply to Dr. Littlejohn, said that the film had not shown the amount of force that had to be used in manipulative treatment. In part this had been intentional, so that the individual movements could be more clearly demonstrated; but it was also a fact that it was difficult to indicate variations of violence in the performance of the movements on a cinematograph film. He regretted that he had created a misconception about the hamstrings and popliteus, which, of course, were powerful rotators of the knee; but the sentence that he had read had been taken out of its context. In reply to Dr. Colquhoun, Dr. Hembrow said that he thought he had stated plainly that one should test beforehand to see whether manipulative treatment was likely to be of benefit in a given case, and that it was a real problem in many cases to decide which patients would benefit by manipulative treatment and which would be treated more satisfactorily by rest. Dr. Hembrow thought that perhaps Dr. Coates had missed his statement about the necessity for radiological investigation prior to manipulation. He would like to take this opportunity of expressing his agreement with Dr. Coates in this matter and of emphasizing its importance. With reference to what Dr. Kennedy had said, Dr. Hembrow said that he too was afraid of the outcome of manipulative treatment applied to the shoulder joint; it was his experience that many patients would sooner move the scapula than the shoulder joint, and in the exercises after treatment it was important to guard carefully against this danger. It was his practice to keep the arm in abduction for a little while and to get early movement. He regarded "ricked back" as a condition that arose from a minute tear in the *erector spinæ* muscles, with the presence of a certain amount of effusion. Dr. Hembrow agreed that manipulative treatment gave these patients relief; but he was afraid he could not explain it. In reply to Dr. Ostermeyer, Dr. Hembrow said that he realized that the portions of the joint affected were richly supplied by nerves; but he was unable to answer the question because he did not know the exact mechanism of the pain.

NOMINATIONS AND ELECTIONS.

The undermentioned have been elected members of the Victorian Branch of the British Medical Association:

Greenshields, Hilda Adella, M.B. *et* Ch.B., 1909 (Univ. Melbourne), 107, Banksia Street, Heidelberg.

Millikan, Alan H., M.B., B.S., 1933 (Univ. Melbourne), Henty Street, Casterton.

Smith, Frederick Perceval Goddard, M.B., B.S., 1933 (Univ. Melbourne), Ballarat Base Hospital, Ballarat.

Taylor, Andrew Tolmie, M.B., B.S., 1934 (Univ. Melbourne), 7, York Road, Glen Iris, S.E.6.

Sinn, Henry James, M.B., B.S., 1933 (Univ. Melbourne), 12, Ormonde Terrace, Primrose Hill, London, N.W.8.

Medical Societies.

THE MELBOURNE PÆDIATRIC SOCIETY.

A meeting of the Melbourne Pædiatric Society was held at the Children's Hospital, Melbourne, on June 10, 1936. Part of this report was published in the issue of October 10, 1936.

Chronic Indurated Ulceration.

Dr. Wilfred Forster showed a boy, aged ten years, who had slight scarring and pigmentation on the outer aspect of the left leg just below the knee. The condition had commenced some four months earlier with the appearance of red nodules which did not look infected, but which gradually softened and became confluent; a fairly deep ulcer formed, which resisted treatment by antiseptics, "Elastoplast", applications of Unna's paste, and sponge rubber dressings; ultimately the ulcer healed spontaneously. Dr. Forster said that he thought, at one stage, that the ulceration was syphilitic; but the boy's blood serum had failed to yield the Wassermann reaction. He had considered the possibility of Bazin's disease as the appropriate diagnosis; but if this were the case, there were many anomalous features.

Dr. John Kelly said that the correct name for Bazin's disease was *erythema induratum*, and that it was classified among the tuberculides. He had not seen an authentic case in an Australian-born patient. Essentially the condition consisted of an erythema with induration; the usual site was on the lower part of the calf of the leg; females at the time of adolescence were the typical subjects; a deep punched-out ulcer developed which was slow to heal and, when healing occurred, considerable scarring followed; it was liable to ulcerate in winter-time and to heal in summer.

Dr. Kelly said that he did not think that Dr. Forster's case was an example of Bazin's disease; he would describe the condition as a chronic pyogenic ulceration with secondary infection, and it might be termed an ecthymatous sore; there was really very little scarring or destruction.

Dr. A. P. Derham wondered what was the underlying cause that made certain people liable to skin sores; he pointed out that it was only an occasional patient who was taking bromides regularly who got a bromide rash, and by no means everybody got staphylococcal infections of the skin.

In reply, Dr. Forster said that the red nodules had stayed for two or three weeks, and that this could not be regarded as a typical pyogenic onset. They broke down and an indolent looking ulcer appeared. There had been nothing resembling impetigo. A strong reaction to the Mantoux and von Pirquet tests had been obtained. He had seen an example of Bazin's disease in an Australian-born subject; but this disease always occurred in a woman around the age of twenty years. He confessed that he was puzzled concerning the correct diagnosis in the case he had shown that evening.

Allergic Manifestations in Children.

Dr. L. Mostyn Powell gave a short dissertation on the subject of allergy before he presented a series of patients to illustrate his remarks. At the outset he made it clear that the personal series was too small to enable him to draw reliable conclusions. He realized that there was nothing original or truly scientific in the method that he had adopted; but he had aimed at getting better results under the conditions which obtained in the out-patient department at the hospital.

Dr. Powell said that the subject was by no means yet well explored. They knew, for example, that a child who was affected suddenly with a series of coughs followed by wheezing breathing, audible in an adjacent room, and continuing for twenty-four hours or so before easing, was probably suffering from asthma, which had been first described by Aurelianus in the fifth century. They knew that it was due to an abnormal hypersensitivity to some foreign substance, that it had a strong familial incidence, and that with removal of the offending allergen or by desensitization the results were usually brilliant, always provided that the diagnosis was made early in the course of the disease before secondary changes, physical and mental, occurred.

Dr. Powell also stated that the sudden appearance on the skin of small white lumps, which were excessively itchy, which were surrounded by erythema and which had a tendency to subside and to recur over months or years, would readily be recognized as chronc urticaria or hives. This condition was an example of cutaneous allergy, and, like asthma, it was due to a hypersensitivity to a foreign substance which was usually ingested and therefore a food substance; at the same time, favourable results followed the removal of the offending allergy. He proposed to limit the discussion to these two common forms of allergy. Chronic urticaria was an annoying, but essentially minor, malady; but asthma was a major malady, and in adults at least was a more dreaded disease than tuberculosis. Asthma frequently commenced in childhood—in 34% of cases under the age of ten years, and in 22% of these in the first year. Dr. Powell thought that to allow a patient with curable asthma to contract pulmonary fibrosis, cardiac failure, and *psychasthenia asthmaticus* was surely a reproach to the medical profession; yet he was quite satisfied that this failure to arrest the condition at an early stage occurred frequently. Concerning urticaria, Dr. Powell thought that it was not the diagnosis which was at fault, though two of his patients had been regarded as sufferers from scabies, but that there was a lamentable tendency when the word hives was mentioned to abandon efforts at cure, to prescribe *Lotio Calaminæ* and to say that the child would grow out of it.

Dr. Powell based his presentation on two main planks: (i) That it was possible even in a busy out-patient clinic to elucidate the causative allergy in a majority of cases, provided one was prepared to devote a short time to intensive interrogation and deduction, and as a result "likely offenders" could be systematically omitted. (ii) That skin testing, which was usually unsatisfactory in cutaneous allergy, might be dispensed with in the early stages of the investigation and treatment. Dr. Powell quoted Salter's aphorism (1860) that asthma was a disposition to maintain and constantly to repeat any peculiarity that might have been acquired—essentially a repetitive disease. He instanced: (*a*) the time of onset—a predilection for night-time, the hour of onset remaining fixed once it was established; (*b*) locality—it was striking how prone an asthmatic was to get the attacks in one environment repeatedly; (*c*) season—if the provoking allergen was one of the pollens the atacks usually occurred in spring-time and, if bacterial, usually in the winter-time, when respiratory infections were more prevalent; (*d*) week-ends—the tendency for the attacks to occur in the week-ends could be noted very definitely in some cases. If a patient was seen in an attack, the diagnosis was usually easy; but if he was not seen in an attack, it could be diagnosed frequently from the history. There was no other disease with the expiratory wheeze audible in another room which was characteristic of asthma. Conditions which should be excluded in the differential diagnosis included enlargement of the thymus gland, retropharyngeal abscess, foreign body in the chest, *laryngismus stridulus* and acute bronchitis. At times it was excusable to make a wrong diagnosis in asthma and to call it acute or chronic bronchitis, because in children the exudative element overshadowed the spasmodic; but if the history was adequately taken, asthma being borne in mind, such mistakes should not be repeated. Importance could be laid on the history of other allergic manifestations, and at times the diagnosis was clinched by the patient's response to an injection of adrenalin.

Dr. Powell included in a list of likely offenders in the causation of asthma: the pollens; animal proteins, especially those of the horse and cat; kapok; duck feathers; house dust; wheat dust; and bacterial allergens; and he added the food allergens as uncommon offenders.

With reference to the diagnosis of urticaria, Dr. Powell emphasized the suddenness of the appearance of the lesions, their extreme itchiness, their tendency to appear in excessive crops, and to be worse in summer-time and when the patient was warm in bed. In the differential diagnosis he referred to the tendency for the papules of *urticaria papulosa* to become infected from scratching, and to the elimination of scabies and of chickenpox; he mentioned the typical sites of the lesions of scabies, that it rarely occurred on the face, that the acari could be withdrawn from the burrows and identified through a magnifying glass; and he drew attention to the favourable response to treatment with sulphur. Dr. Powell's list of likely offenders in the causation of urticaria included a number of food allergens, such as breakfast cereals, honey, potato, chocolate, egg, fish, pig fat, lobster, tomato, apple, orange, banana, celery, strawberry, cabbage and cauliflower; and he added certain drugs to the list; his group of uncommon offenders included rice, tapioca, boiled skimmed milk or dried milk, lamb, egg yolk, chicken, spinach, grapefruit, pears, peaches, pineapples, peas, *Zwieback*; parasites, such as thread worms and hydatid cysts, were added to this list.

Dr. Powell's scheme was to establish the diagnosis from the history and by examination of the patient, and to make a painstaking and earnest attempt to discover the allergen by listening to the mother's ideas and by making suggestions combined with omissions of suspected allergens from the patient's environment or diet, using the lists (which appear above) and insisting that the parents should keep a diary of events for his perusal. In eliminating articles of food from the diet, he used the articles in the list of unlikely offenders as a substitute step by step, for the articles in the list of likely or common offenders. He felt that if he could eliminate the causative allergen and prevent a recurrence of the attacks in childhood, this action fulfilled the requirements of treatment; but occasionally it was possible to desensitize the patient to a proved offending allergen. Dr. Powell said that he had been agreeably surprised with the degree of success which had attended his efforts to apply this scheme in actual practice, and he presented a number of patients to illustrate how it worked.

One patient was a little girl who had failed to get relief for two years on the mistaken diagnosis of acute bronchitis and who had lost her tonsils and been subjected to an operation on the antrum. The history revealed a familial tendency to asthma and the causative agent in a hawthorn hedge.

Another child had been subject to urticaria for two years; investigation established that the causative allergen was in the breakfast cereals. On their elimination the patient had been free from hives for four months, with the exception of one crop, the appearance of which was evoked by the return of the breakfast cereals to his diet for one day.

Another boy suffered from asthma when he slept between sheets which had been laundered at a public laundry, but he did not get attacks when the same sheets were laundered at home.

Several other children were presented in whom the offending allergens were kapok, breakfast cereals, egg and potato, and in some instances finality had not yet been reached.

Dr. Douglas Galbraith thanked Dr. Powell for the interesting way in which he had presented the important subject. With reference to the child in whose case Dr. Powell suspected that the causative allergen might be found in the process of laundering sheets in a public laundry, Dr. Galbraith thought that it might be of interest to Dr. Powell to know that various chemicals could be used to soften the water and to make the soap go further.

DR. A. P. DERHAM said that he had not realized before that celery, cabbage and cauliflower were common causes of urticaria in children; he would like to suggest to Dr. Powell that walnuts and other nuts should be added to the list of common offenders. Dr. Powell had not stressed the importance of the neurogenic factor in urticaria; attacks of hives could be precipitated by excitement. Dr. Derham referred to a child who was liable to get severe attacks of papular urticaria before examinations. Another child, aged two years, suffered from hives every time the grandmother came and played "bears". With reference to the systematic elucidation of urticaria, Dr. Derham had found that a scheme given to the parent in writing had been useful for people who could not pay a series of visits to him privately, perhaps because they lived at a distance; he let the parent find the cause, and this was often possible. While Dr. Derham expressed himself as in agreement with Dr. Powell's views on asthma, he thought that in trying to find the cause one was only finding the effective stimulant that pulled a trigger that was already cocked by such nervous factors as excitement or worry. He had found it necessary to postulate two factors; one alone was not sufficient. One of his children, from the age of five years to the age of eight years, had had at least half a dozen attacks of asthma, in which he would become cyanosed and alarmingly ill, but always responded to adrenalin therapy; for ten years he had been free from asthma, but recently he had become subject to migraine. In this case Dr. Derham had noticed that the attacks followed fatigue, chill, the dust of a visit to the Royal Show or the Zoo, the onset of intercurrent illness, or dietetic causes, such as nuts. Dr. Derham was in the habit of searching for a combination of at least two predisposing causes. With reference to the child in whose case the laundry was getting the blame, Dr. Powell might like to know that boiled water was not used in washing machines and that at the public laundry the sheets would go through with other people's clothes; perhaps the lack of sterility might be of importance. Dr. Derham also remarked that in his experience kapok was a common exciting cause of asthma. In conclusion, he emphasized the two suggestions he had made: the nervous cause must not be overlooked, and one should search for the combination of the two factors which acted together as an adequate stimulus to provoke an attack of asthma.

DR. MONA BLANCHE said that she had been interested personally in Dr. Powell's remarks about cutaneous tests, for she had recently given up this testing at the Children's Hospital after having done a lot of it for three years. She had had some satisfactory results from intradermal tests, but not with the scratch tests. She had found that the house dust problem was a big one, and she had been struck by the fact that an asthmatic child was likely to have infrequent attacks of asthma although he was living all the time in the same environment and eating the same sort of food repeatedly; she supported Dr. Derham's postulation of a double cause. Dr. Blanche mentioned a child who frequently had attacks of asthma in the morning when his mother swept the house before he went to school; the attacks ceased when, at her suggestion, the mother did not stir the house dust until after the child had gone to school. Dr. Blanche thought that cutaneous testing for food substances was futile, unless perhaps one had a very large and expensive set of allergens. The only positive result she had obtained was with a boy who was sensitive to egg and who got an attack of asthma each time he had even the least amount of egg; in this instance the skin test was superfluous because the child had a very gross distaste for eggs. Dr. Blanche referred to the value of posture exercises in the treatment of asthmatic children in addition to the desensitization to specific allergens. These exercises were designed to teach the children to increase the range of movement in expiration. Miss Vera Carter, who had been self-cured by exercises, was the instructress at the hospital and was getting good results.

DR. JOHN H. KELLY said that in all allergic conditions one had to expect bizarre phenomena with capricious results; the theories did not conform to the clinical facts, and it surprised him how remarkably allergists performed mental gymnastics. He often wondered why people should be hypersensitive at all. In a great many cases failure occurred when the cause was investigated; the most direct method was to investigate the actual phenomena. In prurigo and urticaria the patients responded to the skin tests for a multitude of substances when in the allergic state, but it was probable that these substances were not related to the skin condition. Dr. Kelly believed that about 80% of children who had infantile eczema were sensitive to egg albumen. He also thought that a sharp distinction should be drawn between the infantile type of urticaria, which was papular, and the urticaria of older subjects, in which large wheals developed; the former variety was exceedingly difficult to treat. Dr. Kelly referred to the asthma-prurigo-eczema syndrome as one that demanded close attention because of the life-long misery and disastrous secondary changes in the lung that might occur. Some patients who had proved tremendously difficult to treat at the hospital had been taken to a home at Mornington and segregated with complete success.

In his reply to the discussion Dr. Powell stated that he had brought the subject forward with the idea of showing that the old attitude was wrong and that something could be done for these patients in an out-patient clinic. The Children's Hospital was the place to pick asthmatics; one-third of those who had asthma in adult life had had attacks before they were ten years of age; the condition should not be allowed to go on into adult life. While he was quiet aware that the series of patients presented that evening was too small to be of scientific interest, the results which he had obtained by putting the scheme into operation had been unexpectedly good, and he had made no attempt to select the favourable results from the unfavourable. In reply to the suggestions which had been made about the public laundry, he would like to say that he had visited the laundry and had been assured that no bleaching agent or other chemical was used in the laundering process, but only water and soap. He had obtained a specimen of the soap that was used and had carried out cutaneous testing with it with negative results. He was interested to learn from Dr. Derham that the water was not boiled, and he was sorry that he had forgotten about the nuts. He was quite prepared to agree with Dr. Derham about the neurogenic factor in the causation of asthma, and he was under the impression that pig fat was quite a common cause of papular urticaria. Dr. Blanche had given the impression that she had discontinued the cutaneous allergy test because she was not satisfied with the results obtained, and this impression supported the attitude he had taken about them. Dr. Kelly's doubt about the relationship between any positive skin test and the allergic lesion strengthened the attitude he had adopted of using an elimination diet, in which he substituted articles from the list of uncommon offenders for articles corresponding to them in the list of common offenders. He was of opinion that this was a better plan than to be guided by the skin tests.

(To be continued.)

Correspondence.

TUBE LOST IN AN EMPYEMA CAVITY.

SIR: There is always a certain anxiety attaching to drainage tubes, especially in the lung or pleural cavities; and the loss of it or part of it may be an unpleasant experience. Early this month, on the fourth day following an operation for empyema on Mrs. T. in the Boggabri Hospital, the matron reported that part of the tube was missing. The proximal part, one and a half inches long, with safety pin, was in position, but the remainder, about three inches long, had broken off and could not be found. This had happened partly by the silk gut suture cutting through and the rest tearing. An X ray screen showed no sign of the tube; but I felt sure the lost part of the tube was inside.

The patient allowed me to operate again, and on removing two inches of the rib next above, allowing me more room, the tube was found and removed, the patient doing well.

The question of the value of X rays to detect tubing arises, especially if there is doubt whether it is present in the cavity or has been lost in the dressings. There are varieties of tubing opaque to X rays, and I would suggest that this kind only should be used for draining cavities.

Yours, etc.,

E. R. ROSEBY, M.B., Ch.M.

Boggabri,
New South Wales,
September 24, 1936.

OSLER AND THE FUTURE.

SIR: I have read with something akin to horror those lines in THE MEDICAL JOURNAL OF AUSTRALIA of September 26, in which Major Greenwood "considers it likely that in a few generations Osler will be at most an occasionally cited name, a kindly and honourable gentleman who escaped a bookish immortality".

Osler had many outstanding claims, any one of which would have brought him distinction, while collectively they have brought him a fame that will last as long as medical science exists.

One of Osler's outstanding claims was that he introduced scientific methods for the teaching of medicine, and especially clinical medicine, which have been adopted far and wide. He did not believe in that sort of instruction described so aptly by John Bell, of Edinburgh, in 1810, where he tells us that "nerves and arteries were demonstrated in a subject fished up from the bottom of a tub of spirits and exhibited at a distance of a hundred feet". Osler would have none of that sort of thing; he took his students to the bedside, and when he was finished with them they had a foundation which lessened the imperative need of the post-graduate repair shop, that seems to have become such a pressing necessity of late in our midst.

Much of Osler's work was devoted to the checking at the bedside day after day, the assertions on diseases made by other observers, and this practice enabled him to gradually get closer and closer to the truth. When a patient died, he followed that patient to the *post mortem* room, where he was able to check his diagnosis in a way that removed all doubt. He boasted that he had spent a goodly span of his life in the *post mortem* room, examining the failures of himself and others.

When Osler had taught day after day, year after year, he had stored up enough material from his own personal experience and had correlated it with the general experience of the profession, as expressed in medical literature, to write a text-book.

To this task he brought a wonderful magazine of knowledge culled from the works of men of all ages; for he had such a wide knowledge of languages that he could go at once and peruse all authors at first hand. The result was that he was able to produce a work on the "Principles and Practice of Medicine" that is at once a guide for the student, an authority in all law courts, and a work that the most experienced practitioner may consult with the same explicit confidence as a Mohammedan does his Koran. It has passed through edition after edition; it has been published in innumerable languages; and even the Chinese, who are always behind in things medical, have translated it and adopted him as their guide. All evidence points to Osler as the greatest physician of ancient or modern times, because he was the best equipped.

Why then should Major Greenwood predict that he will soon be almost forgotten? I am afraid the reason is that Major Greenwood may not be competent enough to follow Osler along the innumerable paths and byways that the great scholar trod, and so he is unable to form a just evaluation of the man whose text-book is a monument which, though it will be altered with time, will always remain as the model for others to try to rival. Garrison described it as the best English text-book on the subject in our time.

In place of Major Greenwood's poor estimate let us substitute the words of Lucretius, for whom Osler, like Lord Morley, had a deep respect: "*Omnes praestinxit, stellas exortus uti aerius Sol.*"

Yours, etc.,

W. J. STEWART MCKAY.

Lismore,
New South Wales,
September 29, 1936.

AUSTRALASIAN MEDICAL CONGRESS (BRITISH MEDICAL ASSOCIATION), 1937.

SIR: The President of the Section of Obstetrics and Gynæcology (Professor Marshall Allan) invites suggestions and offers of papers for sectional meetings from any who may be willing to contribute same.

Will any who are desirous of doing so please communicate with me at the address given below as soon as possible, so that a programme may be drawn up?

Yours, etc.,

H. M. FISHER,
Honorary Secretary,
Section of Obstetrics and Gynæcology.

188, North Terrace,
Adelaide,
South Australia,
October 2, 1936.

ORTHOPTIC TRAINING.

SIR: I have read your leader of October 3 with much interest; but at least one statement in the last paragraph is definitely questionable. The sentence I refer to is this: "Whether the time is ripe for the establishment of an Australian Orthoptic Council is open to argument." To my mind there can be no argument, in view of the fact that an Orthoptic Council in Australia is overdue.

Cassius's assertion when decrying Cæsar, "The fault, dear Brutus, is not in the stars", appears appropriate at the present moment. The ophthalmological surgeons and their ancillary workers in Australia today are definitely in a dangerous position from lack of unity and cooperative activity. On all sides this is apparent, the question at issue being a pressing example.

The orthoptic treatment of squint and minor muscle errors has now been established beyond doubt as a very strong weapon in the hands of competent surgeons. It has been proved conclusively that many squints will train out of their angle quite satisfactorily without operative interference and without the complete disablement and risk which this entails. It is also very apparent that the busy ophthalmic surgeon cannot devote his time to training of individual patients and must relegate this to orthoptic technicians (nevertheless he himself should have an adequate working knowledge of the technique and be able to discuss procedures and results with his technicians as occasion arises). Consequently each technician should be fully trained in her work and should have passed satisfactory examinations and should have gained a certificate by some approved association. Unless this is done and the standard of knowledge of orthoptic trainers defined, the work is prone to be undertaken slovenly by inexperienced workers and brought into disrepute.

In Australia there is no council of orthoptic trainers similar to that existing in England, and some of the present technicians display a distinct ignorance of the first principles of optics and myology. This is greatly to be regretted and needs immediate rectification; but the major fault lies with the ophthalmic surgeons themselves.

So far, in Australia, there is no ophthalmological society to attend to the needs and interests of ophthalmic surgeons. This should be remedied at once. At the next Australasian Medical Congress, to be held in Adelaide in 1937, every effort should be made to form an ophthalmological society, and one of the first objects of this new society should be to confer with the orthoptic trainers now practising in Australia regarding the formation of an orthoptic trainers'

council, with aims and regulations similar to the British Orthoptic Council. Thus much may be done to raise the standard of an already important and essential branch of ophthalmology.

As I am sure very few readers are aware of the scope and activities of the British Orthoptic Council, I should like to quote the following extracts from their regulations:

(A) Regulations for Examination of Orthoptic Students.

1. Students must not be less than eighteen years old, and must have passed the School Certificate or its equivalent. On entry, students shall sign an undertaking to abide by the ethical rules for practice drawn up by the Orthoptic Council.

2. Before being accepted for training, students must themselves undergo ophthalmic examination by a member of the staff of the hospital at which they propose to be trained.

3. Students must undergo a course of practical training of not less than one year in an approved school of orthoptics, and take two courses of theoretical instruction to be given February to June and September to November.

4. Examinations are to be open only to students sent through those orthoptic schools associated with the Council, and are to be held twice a year, in July and December, on the work covered by the syllabus. They are to consist of a paper, a *viva voce*, and a practical examination, special weight being given to marks obtained in the practical examination. The entrance fee for examination is £3 3s., to be paid to the Treasurer before the examination.

5. Examinations may be held outside London, upon request to the Orthoptic Council, at any school of orthoptics recognized by the Council at the time designated by the Council.

6. Examiners are to be accepted for appointment by the Council, and precautions taken that the identity of students taking the examination is, as far as possible, concealed from the examiners. Students are to make use of numbers instead of their names in the written examinations.

7. Candidates who satisfy the examiners will be given a certificate of proficiency. Unsuccessful candidates may present themselves for re-examination at a later date.

(January, 1935.)

Regulations for squint training were published in *The British Journal of Ophthalmology*, February, 1935, and the following is an extract:

(B) Ethical Regulations.

Students wishing to be trained will be required to agree to a list of regulations controlling the principles and practice of orthoptics which contain, *inter alia*, statements that:

(*a*) They shall only work with and under the direction of fully qualified medical practitioners engaged in ophthalmology.

(*b*) They shall not prescribe glasses or medicaments.

(*c*) They shall not advertise.

(*d*) They shall abide by the decision of the Orthoptic Council.

(*e*) They shall employ no secret treatment.

(*f*) They shall not train students who will not enter under the engagements required of all squint trainees by the Council.

(C) Orthoptic Council Syllabus for Student Orthoptic Trainers—Qualifications for Entry.

Duration of course: One year.

Fees for the complete course of the instruction to be paid in advance.

Parts I and II to run concurrently.

Part I of course.—Lectures, tutorial classes and demonstrations in:

Elementary optics: Reflection, refraction, prisms, lenses.

Elementary ophthalmic optics: The eye as an optic instrument, visual angle, angle γ.

Anatomy of the eye and contents of the orbit, lid and lachrymal apparatus, central connexions of nerves.

Physiology: (*a*) General—muscle, nerve and their nutrition. (*b*) Special—vision, binocular vision, accommodation, pupil reactions, effects of atropine, action of extrinsic muscles, visual paths, visual fields.

Visual defects: Errors of refraction and principles of correction, pathological conditions.

Squint: Ætiology, theories of fusion, suppression, amblyopia.

Part II of course.—Lectures, tutorial classes, demonstrations and practical work.

Methods of Investigation: Diagnosis and measurement of squint and heterophoria. Investigation of functions of extrinsic muscles. Measurement of visual acuity.

Treatment: Principles of correction of errors of refraction, of occlusion, and of operation. Principles of orthoptic training. Instruments for training, demonstration of instruments, practical instruction in use.

(January, 1935.)

From the above it is clear that the British Orthoptic Council has completely defined the high standards expected of orthoptic trainers and has given them a status in the community which they deserve. Undoubtedly orthoptic trainers in Australia need their position clarified in the same direction.

Much investigation is required into the anomalies of binocular vision. During the past five years considerable ground has been traversed in this direction, but a still greater field remains unexplored. Already much light has been thrown on many obscure aspects of squint. For instance, it is quite easy, from watching the behaviour of alternators and patients with abnormal correspondence, to understand why only 50% of squints straighten with glasses, and why two squints of the same deviation give quite different post-operative cosmetic results.

In order that many other unexplained phenomena may be elucidated, ophthalmic surgeons and orthoptic trainers must keep more detailed data of squint cases. Then from time to time both the yet unborn Ophthalmological Society and the Orthoptic Council must meet and compare results, discuss difficulties encountered, and so lead the way to a clear understanding of the non-operative correction of squints and muscle errors.

Sir John Parsons recently stated: "It [orthoptic treatment] has one overwhelming argument in its favour, namely, that when it is successful it cures the squint."

We must therefore look to the Ophthalmic Section of the Adelaide Congress of 1937 to set both these societies in action, and if this is accomplished a great milestone in the history of ophthalmology in Australia will be passed.

Yours, etc.,

J. Bruce Hamilton.

174, Macquarie Street,
Hobart,
October 5, 1936.

"ENSOL" IN THE TREATMENT OF CANCER.

Sir: In recent issues of Sydney newspapers the Federal Minister for Health, the Honourable W. M. Hughes, is credited with some very remarkable statements on the subject of the effects of X rays in the treatment of cancer. In *The Sydney Morning Herald* of October 8 there is an account of the answers made by Mr. Hughes to certain questions asked of him in the Federal House in the sitting of October 7. These questions were put by Mr. Jennings on the subject of the Minister's statement published in the Sydney *Sun* of October 6. This appeared under the heading of "Ensol Report" as follows:

The Federal Minister for Health (Mr. Hughes) said to-day that the Commonwealth Government was keenly interested in the possibilities of ensol for cancer treatment.

The Government, he added, had asked the directors of the Hendry Connell Research Foundation, Kingston, Ontario, Canada, for a detailed report upon the efficacy of the treatment.

"It is not right to raise hopes before definite evidence is available", said Mr. Hughes, "but even if it does no more than radium treatment, it will be an improved method.".

Mr. Hughes spoke of the dangers of X-ray treatment in tending to dissipate the cancer cells to other portions of the body.

Compared with this, he said, ensol had definite advantages. It had no such pathological effects and could be taken in the mouth.

For Cabinet.

When Mr. Hughes has considered the report from Canada and also a written report which he expects from Dr. Neville Davis of Sydney, he will decide whether to submit recommendations to the Federal Cabinet for the use of ensol in Australia.

"If it does all that is claimed for it", he added, "it will mean the elimination of radium treatment."

In *The Daily Telegraph* of October 7, under the heading of "New Treatment for Cancer", the following appears:

Dr. Neville Davis brought from America ample supplies of ensol for the treatment of cancer, but none will be available until the Federal Cabinet has decided what action it will take.

Dr. Davis was commissioned by the Federal Government to investigate cancer treatment in Canada and the United States.

He will submit this week a detailed report of work done, including his own, at American and Canadian institutions.

It will be possible to manufacture ensol in Australia, says Dr. Davis.

"If ensol does all that is claimed for it, it will mean the elimination of radium treatment", said the Federal Minister for Health, Mr. Hughes, yesterday.

In *The Sydney Morning Herald* of October 8, under the heading "Treatment of Cancer", besides a statement by the President of the Australian and New Zealand Association of Radiology, there is an account of the replies made by Mr. Hughes to Mr. Jennings's questions in Parliament. This was as follows:

In the House of Representatives yesterday afternoon, Mr. Hughes was questioned by Mr. Jennings (U.A.P., N.S.W.) about his statement. He replied that, in certain circumstances, the application of radium and (or) X-ray treatment to deep-seated cancer had the effect of driving some of the cancer cells from the locale all over the body.

"I speak, however, with all humility and reservations proper to a layman", he added. "I would not have hon. members assume that this condition could not arise independently of radium or X-ray treatment. The point I was trying to make was that, if the ensol method of treatment had the same curative effect as radium or X-ray treatment, and was not attended by any ill-effects, it might be preferable."

Mr. Hughes, it will be seen, speaks as a layman with "humility and reservation". But he leaves it to be inferred that the information about X rays and radium causing dissemination of cancer came to him from the same source as his information about "Ensol". This is most unfortunate for Dr. Neville Davis, whom Mr. Hughes names as his informant on the subject of "Ensol".

Dr. Davis, I am sure, will be among the first to disclaim any pretensions that by training and experience he is qualified to express any opinions upon the use and effects of X radiation in the treatment of cancer. Whatever may be his qualifications to speak on the cancer problem and upon the complicated immunological and biological aspects of cancer treatments, it is certain that, when it comes to radiological knowledge and experience of a standard required to advise a Minister of the Crown upon the effects of such treatment in cancer, Dr. Davis does not possess such knowledge, and that still less will he claim to possess it.

Therefore Mr. Hughes's statement must be taken to depend upon his own "humble" opinion as a layman.

Such a statement as that credited to him, to the effect that there was a danger of X rays "dissipating the cancer cells to other portions of the body", is not only quite incorrect, but is most mischievous. It is certain that some patients will decline treatment by X rays and radium because of the fear engendered by such a statement by the Federal Minister of Health. And as many hundreds of patients with carcinoma of the skin, lip, tongue, uterus, breast and other organs are cured annually in Australia by X rays and radium, it is probable that some patients whose lives should have been saved will be lost through Mr. Hughes's incorrect statement. It would indeed be interesting to learn how Mr. Hughes or his medical informant can explain why "the application of radium and (or) X-ray treatment to deep-seated cancer" has the effect of disseminating cancer cells all over the body (*The Sydney Morning Herald*, October 8, 1936) while the same treatment most certainly fails to produce the same dissemination when used in the treatment of superficial cancer.

Such a statement could only come from a person completely ignorant of X ray and/or radium work. In actual fact there is evidence that the exact opposite is true and that pre-operative X radiation tends to immobilize cancer cells which are making their way through the lymphatic channels.

In the interests of patients and of truth it is highly desirable that Mr. Hughes should retract utterly his statement of the dangers of dissemination of cancer by X rays and radium, or else disclose the identity of his informant.

On the subject of "Ensol", it is clear that before attempting to put such a remedy into practice, the Government should take the advice of experienced workers in the cancer research organizations operating in the various States and the Commonwealth.

The proper place for the examination of the claims of "Ensol" would be the next Cancer Conference at Canberra. At such a meeting Dr. Neville Davis can put before the pathologists, biochemists, cancer research and cancer treatment workers of long experience, the reasons that make him so optimistic as to the possible benefits of "Ensol" in cancer.

The airings of such enthusiasms through the public Press, especially when the subject of "Ensol" and its effects are in the very early experimental stages, is productive of nothing but harm. And when such expressions are accompanied by manifestly incorrect statements about the results of other methods of treatment, it is a sign of bad advocacy, or of a very weak case.

Yours, etc.,

E. H. MOLESWORTH.

"Beanbah",
235, Macquarie Street,
Sydney,
October 9, 1936.

The Royal Australasian College of Surgeons.

MEETING OF THE BOARD OF CENSORS.

THE next meeting of the Board of Censors of the Royal Australasian College of Surgeons will be held early in 1937.

Candidates who desire to present themselves at this meeting should apply to the Censor-in-Chief for permission to do so on or before November 30, 1936.

The appropriate forms are available at the College, Spring Street, Melbourne, and at the offices of the various State secretaries.

Books Received.

LEGAL PROBLEMS IN MEDICAL PRACTICE, by D. H. Kitchin; 1936. London: Edward Arnold and Company. Demy 8vo, pp. 232. Price: 10s. 6d. net.

TEXT-BOOK OF PATHOLOGY, by R. Muir, M.A., M.D., Sc.D., LL.D., F.R.S.; Fourth Edition; 1936. London: Edward Arnold and Company. Demy 8vo, pp. 1001, with illustrations. Price: 35s. net.

LEAGUE OF NATIONS PUBLICATIONS: THE PROBLEM OF NUTRITION, Volumes I, II and III; 1936. Geneva: The League of Nations Publications Department; Sydney: H. A. Goddard, Limited. Volume I: Interim Report of the Mixed Committee on the Problem of Nutrition. Royal 8vo, pp. 98. Price: 2s. 6d. net. Volume II: Report on the Physiological Bases of Nutrition. Royal 8vo, pp. 27. Price: 8d. Volume III: Nutrition in Various Countries. Royal 8vo, pp. 271. Price: 7s. net.

CLIO MEDICA: A SERIES OF PRIMERS ON THE HISTORY OF MEDICINE, edited by E. B. Krumbhaar, M.D.; XVII: Gynecology and Obstetrics, by E. M. Janeson, M.D.; 1936. New York: Paul B. Hoeber. Foolscap 8vo, pp. 185, with illustrations. Price: $1.50 net.

MEDICAL DIRECTORY FOR AUSTRALIA; SECOND ANNUAL ISSUE, 1936-37; 1936. Australia: Errol G. Knox. Demy 8vo, pp. 562. Price: 21s. net.

VASCULAR DISORDERS OF THE LIMBS, DESCRIBED FOR PRACTITIONERS AND STUDENTS, by Sir Thomas Lewis, C.B.E., F.R.S., M.D., D.Sc., LL.D., F.R.C.P.; 1936. London: Macmillan and Company, Limited. Medium 8vo, pp. 122, with illustrations. Price: 6s. 6d. net.

Diary for the Month.

OCT. 20.—Tasmanian Branch, B.M.A.: Council.
OCT. 20.—New South Wales Branch, B.M.A.: Ethics Committee.
OCT. 21.—Western Australian Branch, B.M.A.: Branch.
OCT. 22.—New South Wales Branch, B.M.A.: Clinical Meeting.
OCT. 23.—Queensland Branch, B.M.A.: Council.
OCT. 27.—New South Wales Branch, B.M.A.: Medical Politics Committee.
OCT. 28.—Victorian Branch, B.M.A.: Council.
OCT. 29.—South Australian Branch, B.M.A.: Branch.
OCT. 29.—New South Wales Branch, B.M.A.: Branch.
NOV. 2.—New South Wales Branch, B.M.A.: Organization and Science Committee.
NOV. 3.—Tasmanian Branch, B.M.A.: Council.
NOV. 4.—Western Australian Branch, B.M.A.: Council.
NOV. 4.—Victorian Branch, B.M.A.: Branch.
NOV. 5.—South Australian Branch, B.M.A.: Council.
NOV. 6.—Queensland Branch, B.M.A.: Branch.
NOV. 10.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
NOV. 10.—Tasmanian Branch, B.M.A.: Branch.
NOV. 13.—Queensland Branch, B.M.A.: Council
NOV. 17.—Tasmanian Branch, B.M.A.: Council.
NOV. 17.—New South Wales Branch, B.M.A.: Ethics Committee.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenencies* sought, etc., see "Advertiser", pages xviii, xix and xx.

DEPARTMENT OF PUBLIC HEALTH, MELBOURNE, VICTORIA: Resident Medical Officer.
LAUNCESTON PUBLIC HOSPITAL, LAUNCESTON, TASMANIA: Resident Medical Officer.
MENTAL HOSPITAL, NEW NORFOLK, TASMANIA: Junior Medical Officer.
PERTH HOSPITAL, PERTH, WESTERN AUSTRALIA: Junior Resident Medical Officers.
PRINCE HENRY'S HOSPITAL, MELBOURNE, VICTORIA: Radiologist.
STATE PUBLIC SERVICE BOARD, QUEENSLAND: Chairman of the Medical Board.
ST. GEORGE DISTRICT HOSPITAL, KOGARAH, NEW SOUTH WALES: Honorary Radiologist.
TOOWOOMBA HOSPITALS BOARD, TOOWOOMBA, QUEENSLAND: Resident Medical Officer.
THE WOMEN'S HOSPITAL (CROWN STREET), SYDNEY, NEW SOUTH WALES: Junior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY Hospital are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

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